Department of Climate Change, Energy, the Environment and Water

Competency benchmark for local water utility operators in NSW

Consultation paper

July 2024

NSW GOVERNMENT

Acknowledgement of Country

Department of Climate Change, Energy, the Environment and Water acknowledges the traditional custodians of the land and pays respect to Elders past, present and future.

We recognise Australian Aboriginal and Torres Strait Islander peoples' unique cultural and spiritual relationships to place and their rich contribution to society.

Artist and designer Nikita Ridgeway from Aboriginal design agency – Boss Lady Creative Designs, created the People and Community symbol.

Competency benchmark for local water utility operators in NSW

Published by NSW Department of Climate Change, Energy, the Environment and Water

[Click here to enter Department or Agency Website, for example, customerservice.nsw.gov.au]

First published: July 2024

Department or Agency reference number: PUB24/510

Acknowledgements

The department thanks the members of the Skills and Training Focus Group for their significant contribution to the development of the competency benchmark.

Copyright and disclaimer

© State of New South Wales through Department of Climate Change, Energy, the Environment and Water 2024. Information contained in this publication is based on knowledge and understanding at the time of writing, July 2024, and is subject to change. For more information, please visit the following websites:

For ECCS documents: https://www.energy.nsw.gov.au/copyright
For Water and Environment https://www.environment.nsw.gov.au/about-us/copyright-and-disclaimer
For General NSW Government https://www.nsw.gov.au/nsw-government/copyright

Contents

Acknowledgement of Country ..... **ii**

Executive Summary **5**

1 Background **10**

1.1 Importance of operator competency 10

1.2 NSW Government commitments to improving skills and training for local water utilities 10

2 Addressing the need for a competency benchmark **14**

2.1 Skills, training and water industry risk management 14

2.2 Existing training requirements for water operators 15

2.3 Benefits of a competency benchmark 16

3 Developing the competency benchmark **18**

3.1 Overview of competency benchmark development 18

3.2 Stakeholder consultation 19

3.3 Understanding job functions and tasks 20

3.4 Competencies required for job functions 21

3.5 Mapping competencies to training 21

4 The competency benchmark for local water utility operators **23**

4.1 Job functions included in the competency benchmark 23

4.2 Competency benchmark training principles 24

4.3 Overview of competency benchmark training 25

4.4 Online induction modules 26

4.5 Work health and safety training 26

4.6 Fundamentals training program 27

4.6.1 Overview of fundamentals training program 27

4.6.2 Job functions addressed by fundamentals training program 28

4.7 Advanced training program 29

4.7.1 Overview of advanced training program 29

4.7.2 Advanced water treatment elective stream 29

4.7.3 Advanced wastewater treatment elective stream 30

4.7.4 Advanced networks elective stream 31

4.8 Training program quality assurance 32

4.9 Maintenance of skills and competency 34
4.10 Competency benchmark governance 34
5 Implementation of the competency benchmark 36
5.1 The department's regulatory expectations 36
5.2 Alignment with existing national approaches 37
5.3 Implementation actions and support 39
6 How to have your say 40
7 Appendices 42
7.1 Appendix A Comparison with trade qualifications 42
7.2 Appendix B Scope of consultation 46
7.3 Appendix C Recommended additional work-related activity units of competency 47
7.4 Appendix D Recommended WHS units of competency 50
7.5 Appendix E Fundamental training program 52
7.6 Appendix F Advanced water treatment plant training program 65
7.7 Appendix G Advanced wastewater and/or recycled water treatment plant training program 71
7.8 Appendix H Advanced networks training program 77
7.9 Appendix I Key to units of competency codes 88
7.10 Appendix J Underpinning skills, knowledge and assessment criteria 89

Executive Summary

> Workers in the water industry face inherent public health, environmental and work health and safety (WHS) risks. Water operators need quality training to ensure they have the skills to manage these risks. The NSW Department of Climate Change, Energy, the Environment and Water (the department) is working with the water and training sectors to support operator competency. One key strategy to improve the delivery of quality training for operators in NSW local water utilities is to define a competency benchmark achieved through the delivery of a standard training program.

Why do we need a competency benchmark for water operators in NSW?

The water industry is challenged by both the low demand and low supply of quality water operator training. This challenge is especially felt in the NSW local water utility sector. One key driver of this challenge is the lack of comprehensive requirements for operators to have completed competency-based training and lack of clear guidance on what skills are needed by water treatment, wastewater treatment or network operations staff.

There are many responsibilities that require operators to be trained, but little advice on what training is appropriate. This is inconsistent with the significant responsibility water operators have for safeguarding public and environmental health and managing work health and safety (WHS) risks. It is out-of-step with requirements in other industries that manage similar risks, such as the electrical, plumbing and gas trades.

The lack of specific training requirements also undermines the vocational training market, reducing supply of training and making access to training difficult for those who do need it. There is a lack of guidance on appropriate units of competency, qualifications and volume of learning. This results in inconsistent training delivery across the state and no clear definition of a ‘qualified’ operator.

The department is proposing to introduce a **competency benchmark**, outlining appropriate training for water operators in the local water utility sector. This would specify the scope and content of vocational training and drive improved access and quality of training delivered by registered training organisations (RTOs). It would promote transferability of skills for operators to work across systems and locations within NSW. It would give confidence to stakeholders, including regulators, of effective operations and risk management. Importantly, it would give the local water utilities the leading voice in the training delivered to their staff, now and into the future.

A government endorsed or mandated competency benchmark for water operators is a primary driver to increase both the demand and supply of quality vocational training for water operators. This document outlines the proposed competency benchmark, based on a common training program, for operational job functions in NSW local water utilities.

Who will the competency benchmark apply to?

The competency benchmark applies to NSW local water utility operators performing job functions that include:

- operating and maintaining water treatment plants
- operating and maintaining wastewater treatment plants
- operating and maintaining water distribution and wastewater collection networks.

The department considers these functions as the priority for setting a benchmark. The department intends to provide guidance on other job functions, such as dam operation and network construction, as part of broader workforce development activities. The competency benchmark may expand to cover these and other job functions in future. *Section 3.3* provides more details.

What is the competency benchmark?

The department has worked with the sector to define a standard training pathway to address the key competencies needed by water operators in the local water utility sector. This includes four key training areas. *Section 4.3* provides more details.

1. **Online induction modules**: Non-accredited courses developed by the industry to help water industry workers and contractors learn about their roles and responsibilities. This includes the aqua card, brown card, green card and future water operations WHS risk awareness card.
2. **Safety training as required by WHS legislation**: Local water utilities must identify and complete the relevant units of competency that relate to the WHS risks faced by operators.
3. **Fundamental operations training, including either water or wastewater treatment stream**: Training covering the fundamental competencies needed by all operators. An operator completing fundamental training is eligible for a Certificate III Water Industry Operations.
4. **Advanced training in either water treatment, wastewater treatment or network operations**: Specialty accredited training for specific job tasks performed in complex water or wastewater treatment plants, or complex water or wastewater networks. Advanced training is consistent with the Water Industry Operator Registration Framework.

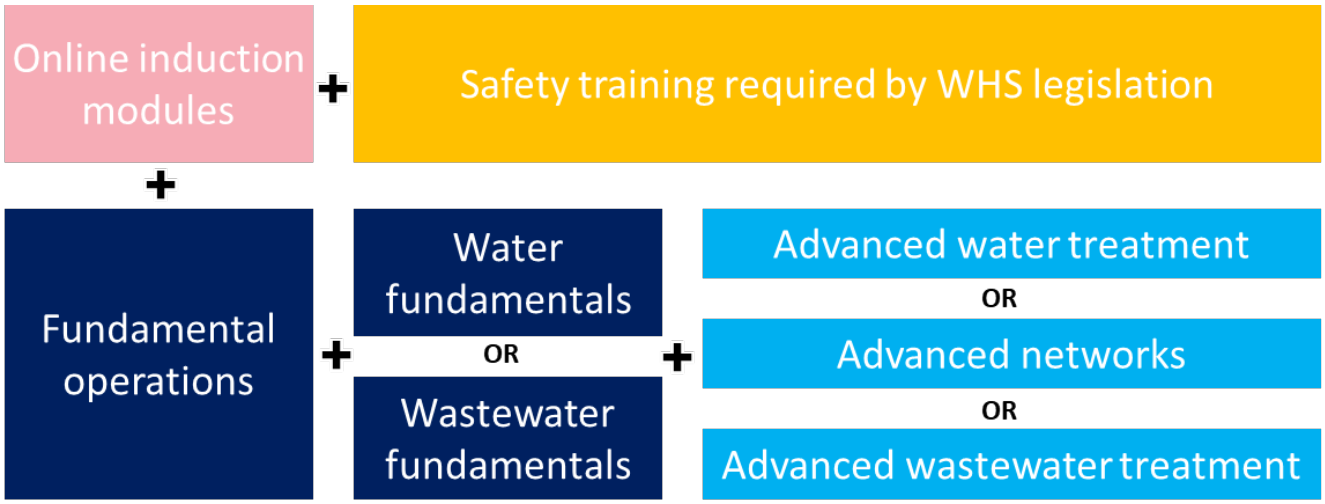

Figure 1 Local water utility operator competency benchmark

How would the competency benchmark apply to local water utilities?

The department would set an expectation that all local water utilities align training and development for their operators to the competency benchmark. Training for new operators joining the industry should be consistent with the benchmark. Existing workers would seek recognition for existing skills through a Recognition of Prior Learning (RPL) process and be expected to complete gap training where needed. *Section 4.9* provides more details.

The department will seek endorsement of the benchmark from NSW Health and NSW Environment Protection Authority (EPA) as appropriate to demonstrate operator competency.

Timelines for implementation would be determined in partnership with the sector, depending on availability of training, funding and recognising the workforce pressures faced by utilities.

How would the competency benchmark ensure quality training delivery?

The benchmark would ensure that operators receive quality training, relevant to their job functions, and contextualised specifically for NSW local water utilities. This is vital to ensuring operators gain the skills needed to manage risks, and to maintain industry confidence in the benchmark itself. *Section 4.8* provides more details.

Quality of training content would be managed through the publication of detailed curriculum documents specifying underpinning skills and knowledge and assessment requirements for each unit of competency. These documents would be made available to all RTOs delivering training, ensuring consistency and relevance of training content and assessment regardless of who delivers it. Training will be consistent with the requirements of the National Water Training Package (NWP) but will include additional content where needed to address the specific requirements of the sector.

The department would also determine appropriate quality monitoring steps in partnership with the sector as the competency benchmark and associated training is implemented. Options for monitoring the quality of training include:

- Centralised feedback on quality of training from operators
- Review and audit of RTO training programs and delivery
- Independent verification of operator competency by industry experts.

What are the benefits of a competency benchmark approach?

A competency benchmark improves consistency and quality of training. It allows local water utilities to drive training delivery and promote transferability of skills for operators to work across systems and locations within NSW. It gives confidence to the community and stakeholders, including regulators, of effective operations and risk management. It provides RTOs with certainty that training course content is relevant and increases the market for training delivery. The increased scope of training would elevate water operations towards a trade-like qualification and supports opportunities for improved pay and conditions for operators. *Section 2.3* provides more details.

How would the competency benchmark be governed?

The department proposes that ownership and governance of the competency benchmark is held by the local water utility sector, in partnership with the NSW Government, to ensure the needs of the sector are heard and addressed. The department would establish a governance committee with members from industry peak bodies, NSW Government regulators, vocational training experts and water operators. The committee would be responsible for monitoring the quality of training delivery, reviewing the scope and content of the competency benchmark and advising the department on implementation challenges. *Section 4.10* provides more details.

How would the department support the implementation of the benchmark?

The department acknowledges that implementing the competency benchmark, especially the changes to training delivery, are unachievable without ongoing support, funding, resources and sector collaboration. *Section 5.3* provides more details.

The department would continue to deliver training and incorporate its existing operator training program into the competency benchmark training delivery.

The department is seeking feedback in this consultation paper on the barriers to implementing the benchmark and will develop a specific implementation plan.

The implementation plan would address:

- Development of curriculum resources relevant to the sector
- Eligibility of training for subsidies, and cost of training to local water utilities
- Availability and competency of trainers to deliver training
- Suitable locations for training delivery and assessment across regional NSW.

How can I have my say on the competency benchmark?

The department is seeking feedback from local water utilities, the wider water industry, vocational training providers and other interested stakeholders. Your feedback may include your level of support for the competency benchmark, potential challenges, opportunities for improvement and levels/types of support and resources required from NSW Government for successful implementation. *Section 6* provides more details.

Consultation will be open for a period of 6 weeks, from 03/07/2024 to 23/08/2024. There are multiple ways to have your say.

- **Attend a webinar** to hear from the project team, ask questions and provide comments. Date: 3 July 2024, time 10.30 am – 11.30 am: Register here
- **Fill out a questionnaire:** This form has specific questions to guide your submission
- **Contact the department directly:**
- regional.town.water@dpie.nsw.gov.au
- **We will come to you:** We will look for opportunities for us to attend existing regional meetings to hear directly from you. If you would like us to come to a meeting or have a direct discussion, please contact us and we will arrange a suitable time:
- regional.town.water@dpie.nsw.gov.au

1 Background

1.1 Importance of operator competency

Workers in the water industry face inherent public health, environmental and work health and safety (WHS) risks. Water operators play the key frontline role in managing these risks to themselves and their communities. Training of operators to ensure they are competent is a key element of systemic risk management in the water industry. A formal approach is needed to ensure that training is providing operators with the appropriate competencies they need to manage these risks.

Water Research Australia (Water RA) clearly articulated the value of water operator competency in its 2019 study The Value of Operator Competency. The study highlighted the need for a well-structured and dedicated approach to water industry operator training and competency verification. It identified multiple contributing factors to historical water quality incidents, including competency deficiency leading to human error.

> A study by *Wu, et al. (2009)* demonstrated just how significant the role human error plays in water quality safety incidents. This study reviewed 62 *Hrudey and Hrudey (2004)* cases and reported that 78% of the errors that occurred were human related. A lack of training and competency provision resides as a vulnerability within an organisation's system, waiting for the right circumstances to present and test frontline operator competency. The literature review demonstrated that, when competency is tested and found to be deficient, human errors occur and compromise the management of water quality safety risks. Walkerton, North Battleford, Flint and Havelock North are high profile examples of overseas incidents where this has been the case.
>
> *Water Research Australia, 2019*

1.2 NSW Government commitments to improving skills and training for local water utilities

The NSW Government recognises that skills and training is a critical issue for local water utilities and has made several commitments to investigating and implementing solutions to solve this problem. Actions to address skills and training have been included in the NSW Water Strategy, the Town Water Risk Reduction Program and the Water operations skills and training action plan. These actions have driven the development of the competency benchmark presented in this document.

NSW Water Strategy

The NSW Government has developed the NSW Water Strategy a 20-year, state-wide strategy to improve the security, reliability and quality of the state's water resources over the coming decades. The NSW Water Strategy addresses key challenges and opportunities for water management and service delivery across the state and set the strategic direction for the NSW water sector over the long-term. The NSW Water Strategy has made a number of key commitments that relate to skills and training.

Priority 6 of the NSW Water Strategy is to **support resilient, prosperous and liveable cities and towns**. Action 6.3: Deliver a new Town Water Risk Reduction Program includes a specific action to:

- identify potential options to address skills shortages in the sector.

Priority 7 of the NSW Water Strategy is to **enable a future focused, capable and innovative water sector**. Action 7.3: Invest in water sector workforce and capability includes the specific sub-actions:

- develop a NSW Water and Wastewater training strategy with local water utilities to understand skills shortages and the types of initiatives required to address these
- invest in our future water workforce, including through education, training, cadet and graduate programs
- promote the important societal contribution that water management makes through creating jobs with purpose and meaning.

and also notes that:

- The new Town Water Risk Reduction Program (Action 6.3) will play a leading role in helping councils and local water utilities to improve skills and capability and access the expertise of the wider water sector.

Town Water Risk Reduction Program

The Department of Climate Change, Energy, the Environment and Water (the department) established the Town Water Risk Reduction Program in 2021. The department, in partnership with local water utilities and the wider water industry collaborated to develop and implement a new approach of working together. The aim of the program is to enable local water utilities to manage risks and priorities in town water systems more strategically and effectively and, as a result, reduce risks in regional NSW communities over time.

Phase 1 of the program (January 2021 to December 2022) included activities to:

- improve the regulatory and support framework for local water utilities
- improve access to skills and training
- encourage greater collaboration
- facilitate greater State Government support,
- investigate alternative funding models.

Phase 2 (January 2023 to June 2025) will:

- address critical skills shortages and boost water operations training and employment opportunities in regional NSW for school leavers, Aboriginal and First Nations students and existing water operators, in partnership with NSW Department of Education (Training Services NSW)
- deliver a new program in partnership with NSW Health to help optimise the performance of high-risk water treatment infrastructure using innovative technology so that more regional towns have reliable, resilient and safe water services
- enable local water utilities to accelerate responses to audits to improve local dam safety and address water quality risks, leveraging the systems and expertise of WaterNSW.

To better understand water operator employment and training issues, and support both the water and training sectors with information, the department commissioned Balmoral Group Australia (BGA) to analyse the NSW water operations workforce and its access to training. BGA drew on a range of data sets to complete this analysis and construct a preliminary picture of water operator training across the state. A summary of the report NSW water operations workforce and training analysis includes data sources, findings and scope of consultation.

This study identified four key barriers to an effective training market. These barriers cannot be considered in isolation.

- Lack of registered training organisations (RTOs)
- Lack of trainers
- Lack of time for training
- Lack of regulation as a driver

Water operations skills and training action plan

The department published the Water operations skills and training action plan (the action plan) to specify the actions under the Town Water Risk Reduction Program.

The action plan includes the department continuing to work with Training Services NSW, the training sector and the water sector to address both worker competence and demand challenges through improved training supply and assessment. The action plan aims to address these challenges to increase skills and competence of existing operators, attract more operators into the sector and increase employment and jobs in regional NSW.

The action plan includes the following actions:

1. Establish a minimum training requirement for NSW water operators
2. Provide guidance to local water utilities on appropriate skills and competencies for staff, including position descriptions and model training plans
3. Allocation of fee free training subsidies for water industry operations (funding available, allocated to water industry)

4. Increase marketing to attract new trainees and school leavers to the water industry
5. Support the conversion of the Certificate III Water Industry Operations to a trade qualification
6. Strategies to support utilities to optimise their use of group training organisations to meet training plans in traineeships and apprenticeships
7. Raise RTO awareness of the market opportunity in the water utility sector with information generated by the Town Water Risk Reduction Program quantifying training needs across NSW and the scope of training delivery needed, particularly for regional and remote NSW towns now and in the next 4-5 years
8. Reduce the costs of RTO market entry of by making quality training resources available nationally to all RTOs
9. Investigate options to make department trainers available to support nationally accredited training. Provide incentives to current operators and employers to become trainers.

The competency benchmark presented in this consultation paper directly addresses these actions.

2 Addressing the need for a competency benchmark

2.1 Skills, training and water industry risk management

There are many responsibilities that require operators to be trained, but little advice on what training is appropriate. This is inconsistent with the significant responsibility water operators have for safeguarding public and environmental health and managing work health and safety (WHS) risks. It is out-of-step with requirements in other industries that manage similar risks, such as the electrical, plumbing and gas trades.

Public health

Water operators have a significant role in managing public health risks to the communities they serve. Local water utilities must address the requirements of the *Public Health Act (2010.* This includes the requirement in Public Health Regulation 2022 s48(b); Processes for managing and reviewing the training for employees and maintaining and improving awareness of employees and contractors about drinking water quality issues.

The competency benchmark is consistent with existing operator training requirements for fluoridation plants in *Fluoridation of Public Water Supplies Act (1957)*.

Environmental protection

Local water utility operations pose risks to the environment, especially relating to the management of wastewater systems and any discharges of effluent into the environment.

Local water utilities are regulated by NSW Environment Protection Authority (EPA) under a range of NSW legislation, including the *Protection of the Environment Operations Act (1997)*. Local water utilities should understand and address any regulatory standards and requirements imposed, or likely to be imposed, under any Environment Protection Licences (EPL), including the following example of typical operating conditions.

> *4 Operating conditions*
>
> *O1 Activities must be carried out in a competent manner*
>
> *O1.1 Licensed activities must be carried out in a competent manner. This includes: (a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and (b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity. Note: The requirements of O1.1 apply to the whole of the premises, including the reticulation system.*
>
> *O2 Maintenance of plant and equipment*

O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity: (a) must be maintained in a proper and efficient condition; and (b) must be operated in a proper and efficient manner.

Operators perform a key role in environmental risk awareness and management, and appropriate training should be provided to operators to ensure they as individuals, and the local water utility under which they are employed, meet these requirements. Refer to Guidance on strategic planning outcome - Understanding environmental impacts for further information on environmental risks specific to local water utilities.

Work health and safety

Workers in the water industry face many and varied WHS risks and the consequences can range from minor to fatal. These include risks associated with hazardous materials, electricity, confined spaces, working at heights and many others. Individuals and organisations have responsibilities to ensure all workers return home safely at the end of every shift. Operators need to be competent in managing WHS risks protecting themselves and their workmates.

SafeWork NSW is responsible for implementing legislation including *Work Health and Safety Act (2011)* and Work Health and Safety Regulation 2017.

Further information on WHS risks specific to local water utilities can be found in these documents published by the department; Incident and emergency management for local water utilities, Guidance on strategic planning outcome – Understanding other key risks and challenges and Guidance on strategic planning outcome - Understanding resourcing needs.

2.2 Existing training requirements for water operators

There are currently no comprehensive requirements for water treatment, wastewater treatment or network operations staff in local water utilities to have completed competency-based training. Although there are many responsibilities that require operators to be trained, little advice is provided on what training is appropriate. Most operators and employers understand the importance of training, and develop local approaches and training programs, but there is a lack of industry guidance on appropriate units of competency, qualifications or volume of learning.

A competency benchmark takes the few existing training requirements and combines these with an industry agreed set of competencies to provide a comprehensive benchmark and training pathway for water operators.

National Water Training Package

The National Water Training Package (NWP) has been designed to define the skills and competencies needed by water industry operators. However, key water industry stakeholders have given feedback that in practice, the delivery of the NWP does not effectively address the needs of local water utility operators. Packaging rules for the NWP have very few mandatory units of competency and allow significant flexibility in the choice of elective units. Operators can complete

vastly different training programs and achieve the same qualification. This results in inconsistent training delivery across the state and no clear definition of a 'qualified' operator.

Implications of lack of training requirements

As a result of the lack of training requirements, qualifications and training levels among NSW water operators vary considerably. Up to a quarter of currently employed operators report they have received no accredited training or hold no industry qualifications or skillsets (*Balmoral Group Australia, 2023*). These circumstances increase the risk of human error leading to incidents that could negatively impact public health, environmental outcomes and/or water service delivery.

The lack of specific training requirements undermines the effective operation of the vocational training market, reducing supply of training and making access to training difficult for those who do seek it.

There is agreement across the water industry that a primary driver to increase both the demand and supply of quality vocational training for water operators would be a government endorsed or mandated competency benchmark for water operators.

> Overwhelmingly the industry consultation cited the lack of a regulatory driver that mandates that operators of water and sewer assets must be trained or qualified to a suitable standard as the principal barrier to Water Operator training.
>
> *Balmoral Group Australia, 2023*.

2.3 Benefits of a competency benchmark

A competency benchmark approach

A competency benchmark supports training delivery, while providing benefits over the direct prescribing of training courses or units of competency. A competency benchmark is grounded in the job functions of the operator and the skills they require, rather than defined by the content of the training course itself. It provides the opportunity for training programs to be designed to address the specific requirements of local water utilities.

A competency benchmark identifies the core skills and competencies needed by operators and clarifies the expected scope and content of training to achieve these competencies. It improves consistency and quality of training delivered by RTOs. It allows local water utilities to drive training delivery and promote transferability of skills for operators to work across systems and locations within NSW. It gives confidence to the community and stakeholders, including regulators, of effective operations and risk management.

Implementing a competency benchmark would take a significant step towards supporting both improved risk management and a sustainable local water utility workforce. This approach directly addresses multiple priorities and actions of the NSW Government as described in *Section 1.2.*

Benefits of a competency benchmark to improved training delivery

RTOs are required to contextualise training course content to the needs of students and their workplaces. A competency benchmark provides underpinning skills and knowledge and assessment requirements that directly relate to the job functions of students. It brings industry and regulator input directly into training programs. This provides RTOs with certainty that training course content is relevant and increases the market for training delivery.

Benefits of a competency benchmark to workforce development

A competency benchmark supports improved attraction and retention of operators in the sector. It gives increased recognition and visibility to water operations job functions. Industry feedback suggests that operators are often not considered skilled workers by employers due to the lack of formal training or licensing requirements. A competency benchmark addresses this concern, supporting opportunities for improved pay and conditions. The increased scope of training would elevate water operations towards a trade-like qualification.

A competency benchmark brings consistency and transferability of operator skills across the sector by ensuring all trained operators have the same set of skills.

Comparison of water operations to similar industries

A competency benchmark increases the volume of learning for many water operators, bringing the industry closer to related industries such as plumbing and gas industry operations (both trade qualifications). Although job complexity is comparable, the plumbing and gas industry operations qualifications require a much higher number of competencies to be completed than a Certificate III Water Industry Operations qualification (NWP 30222). For further information comparing this qualification to trades refer to *Section 7.1 Appendix A*.

3 Developing the competency benchmark

3.1 Overview of competency benchmark development

The department partnered with the sector and took a strategic approach to developing a competency benchmark. This included extensive consultation with staff at local water utilities, water operations and training experts to understand the job functions of operators, and map these to the skills and competencies needed to complete these functions effectively. This was then mapped to training to define the competency benchmark.

The figure below demonstrates the process undertaken to develop the competency benchmark.

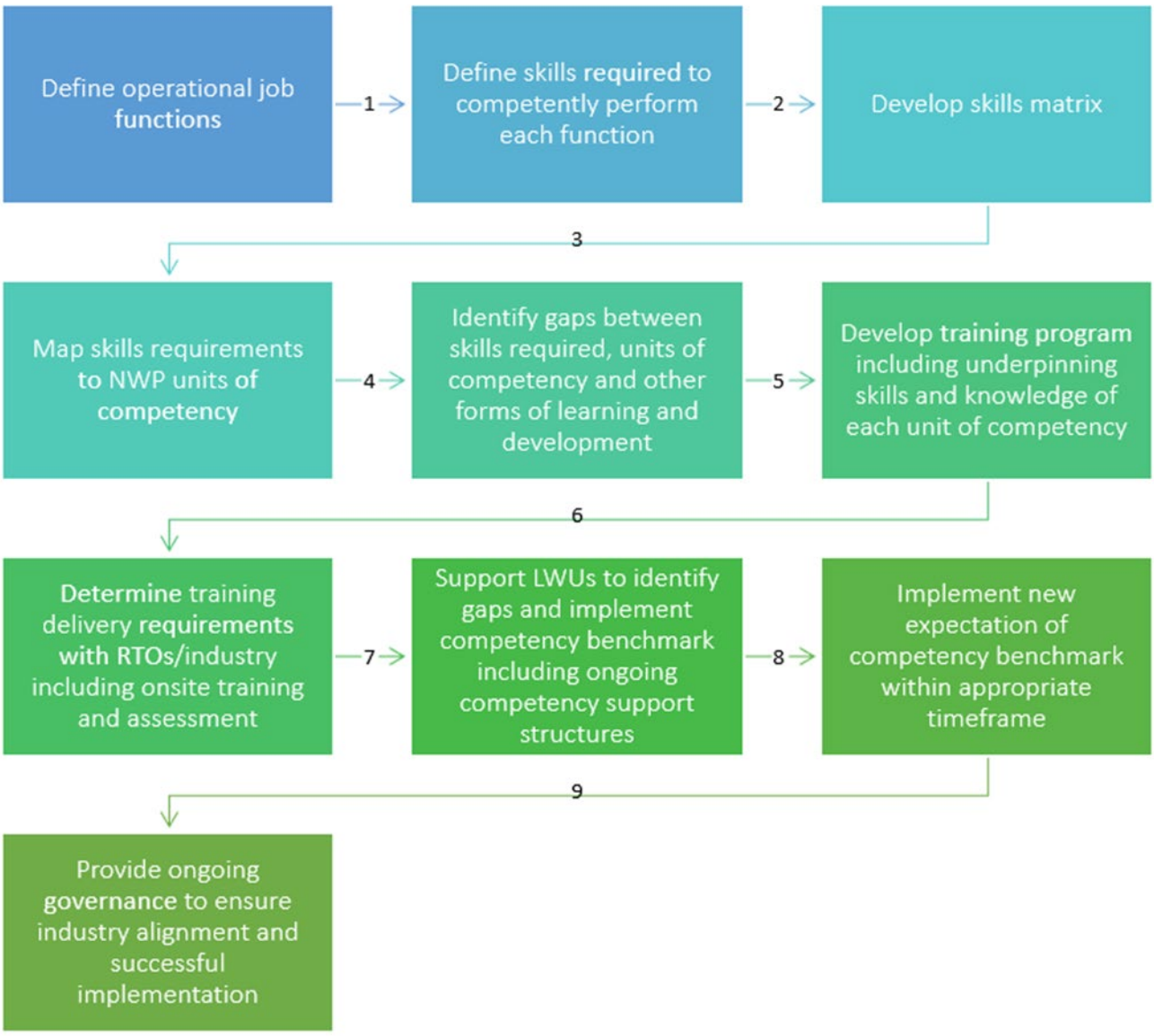

Figure 2 Development of the competency benchmark

3.2 Stakeholder consultation

The first step in the department's consultation approach to developing the competency benchmark was to understand the training needs of local water utilities. This was done through a process of co-design with a Skills and Training Focus Group (focus group) of water and training industry experts. As the needs of local water utilities were better understood, other stakeholders have been, and continue to be, involved in consultation.

The focus group was established in August 2023 to guide implementation of the action plan. This includes representatives from seven local water utilities, NSW Water Directorate, water utilities alliances, joint organisations, Local Government NSW, United Services Union, NSW Public Sector Industry Training Advisory Body, Training Services NSW, experts and specialists from the NSW water and VET industries. The focus group has provided guidance and advice through a co-design approach of the competency benchmark.

A group of operators who are currently working in a variety of operational roles in local water utilities across the state, have taken part in consultation and provided feedback.

Discussions have taken place with other regulators (NSW Health and NSW EPA) and stakeholders at a national and state level including NSW, Victoria and Queensland. RTOs who currently deliver (or may deliver in the future) water training across NSW have been included in consultation and provided feedback. A list of 43 organisations involved in targeted stakeholder consultation during development of the competency benchmark is provided in *Section 7.2 Appendix B*.

The figure below demonstrates the stakeholder engagement process leading up to public exhibition.

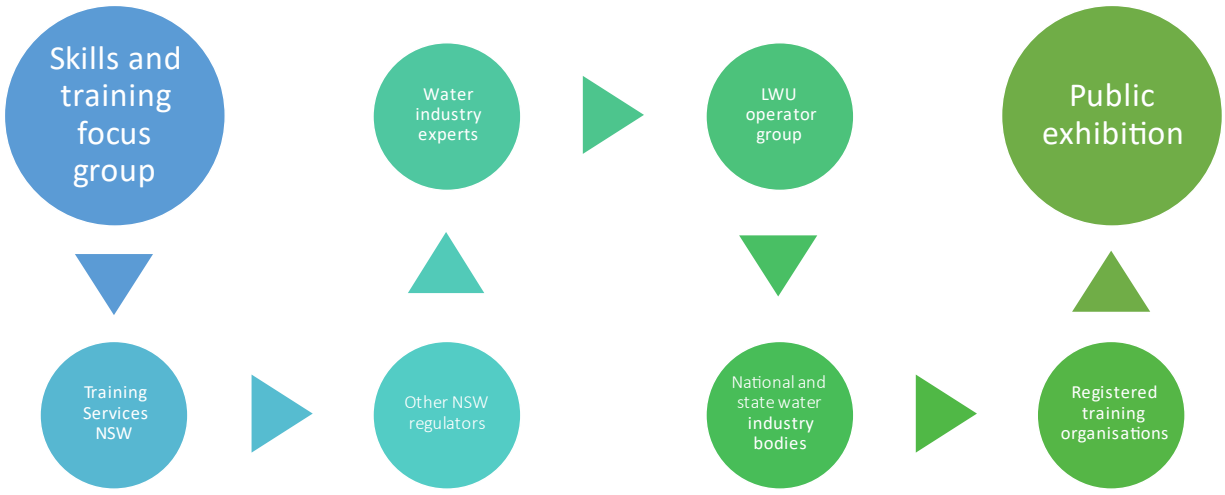

Figure 3 Stakeholder engagement during development of the competency benchmark

3.3 Understanding job functions and tasks

Water operators have a defined job role and function (the location, responsibilities and objectives that define an operator's job) and carry out specific operational tasks in day-to-day work.

The department worked with the focus group to document and understand the range of tasks carried out by local water utility operators. The range of tasks included:

- Operate and maintain infrastructure
  - Water treatment plants
  - Wastewater treatment plants
  - Reticulation, pump stations and reservoirs
  - Optimising operations and identifying issues
- Monitoring and reporting
  - Data collection
  - Telemetry / Supervisory Control and Data Acquisition (SCADA)
  - Data management and analysis
  - Regulatory reporting
- Water and process testing
  - Water sampling
  - Laboratory, field and bench testing
  - Understanding results and actions required
- Incident and emergency management
  - Incident preparation and planning
  - Incident response, recovery and debriefs
- Comply with regulatory requirements
  - Environmental
  - Public Health
  - WHS
- Customer service
  - Complaints handling and response
  - Assurance to councillors and community that water is safe and environment is protected

The job roles of water operators differ depending on the systems they work in and the needs of the water utility, but many operators carry out similar tasks regardless of their role. This consistency in

job tasks shows that while job roles may differ, job functions across the sector are often common, and could be supported by a defined training program.

3.4 Competencies required for job functions

The department worked with the focus group to map the job functions of water operators to a set of underpinning skills and knowledge required to perform these job functions.

The competency benchmark defines the skills and knowledge required to competently perform job functions. Skills and knowledge are grouped into the following categories.

- **policies, guidelines and regulatory requirements** e.g., Australian Drinking Water Guidelines, Environment Protection Licences
- **interpersonal skills** e.g., teamwork, communications, problem solving
- **data management** e.g., analyse data and monitor trends
- **work health and safety** e.g., assessing safety risks, performing tasks safely
- **trade-like skills e.g.,** basic mechanical and electrical knowledge
- **incident and emergency management** e.g., incident response, risk management
- **water sampling and testing** e.g., collecting samples, interpreting results
- **treatment processes** e.g., filtration, digestions, disinfection.
- **network processes** e.g., safe repair of mains, operation of pump stations.

Skills and knowledge are defined for each of the job functions, based on an understanding of day-to-day job tasks, level of supervision, responsibility, and complexity. As many operators carry out similar job functions, many skill and knowledge requirements are also common.

3.5 Mapping competencies to training

The skills and competencies required to perform job functions were then mapped to relevant training delivery, largely focused on individual units of competency contained in the NWP. This forms the basis of the competency benchmark and training programs described in the next chapter. The example below demonstrates the mapping process using the example of customer service.

Example competency mapping: Customer service:

- **skills and knowledge grouping**: Interpersonal skills
- **specific skills**: Customer interaction, communication, problem solving and dispute resolution
- **relevant unit of competency in NWP**: NWPGEN026 Provide and promote customer service
- **unit description:** This unit includes responding effectively to the needs of internal and external customers by the application of the organisation's standards and processes. The ability to solve problems, communicate effectively and seek opportunities to improve service

to customers is essential to performance. Training would include specific examples of Council's vision/goals/strategy, water and wastewater customer service plans, standards and on-call responses, Delivery Program, Operational Plan, community strategic plan and consumer service policy

- relevance to operators: Fundamental skill for all operators, include in core fundamentals training.

4 The competency benchmark for local water utility operators

4.1 Job functions included in the competency benchmark

The competency benchmark defines a set of job functions that are common to the many and varied operational job roles across the NSW water sector related to drinking water, wastewater and network operations. Additional job functions, such as dam safety and construction roles, may be defined in the future. Recycled water treatment operations may also be defined as a separate role in the future, as more specific training becomes available. *Section 7.3 Appendix C* provides some guidance on training suited to other job functions.

The competency benchmark uses the term 'water operations' to cover all operational roles related to operation of drinking water, wastewater, recycled water and networks infrastructure. These have been grouped into five categories of job functions described below:

Water operator:

- works primarily in a water distribution network or water treatment plant
- works independently on basic water distribution network tasks
- works independently on basic water supplies, such as groundwater with chlorination systems
- works under supervision on complex water distribution network tasks
- works under supervision at a water treatment plant.

Wastewater operator:

- works primarily in a sewer network or sewage treatment plant
- works independently on basic sewage network tasks
- works independently on basic sewage treatment plants such as oxidation pond or trickling filter systems. These systems generally have no chemical dosing or automation
- works under supervision on complex sewer network tasks
- works under supervision at a complex sewage treatment plant.

Advanced water treatment plant operator:

- works primarily in a water treatment plant
- works independently to operate a water treatment plant including chemical dosing, filter operation and disinfection.

Advanced wastewater and/or recycled water treatment plant operator:

- works primarily in a sewage treatment plant and/or recycled water treatment plant
- works independently to operate a complex sewage and/or recycled water treatment plant including activated sludge digestion, chemical dosing, nutrient removal, disinfection and/or water recycling.

Advanced networks operator – water, wastewater and/or recycled water networks:

- works primarily on water, wastewater and/or recycled water distribution networks
- works independently on complex water, wastewater and/or recycled water network tasks including excavation, inspection, repair and maintenance of water/sewer/recycled water mains, disinfection of water mains, inspection of backflow prevention devices.

These five job functions have informed the development of competency benchmark training. Each function has a different end-point in the training programs. Job roles that cover multiple job functions would require increased training.

4.2 Competency benchmark training principles

The following principles would apply to training delivered under the competency benchmark:

- training would be aligned with the VET framework. This will allow for operators completing training to gain recognised qualifications and skills, make employers and training providers eligible for subsidised training, and ensure that training providers meet VET quality standards
- the competency benchmark will specify additional content above the existing requirements of the NWP where required. Additional content is designed to ensure operators are competently fulfilling job functions and legislative requirements, such as protection of public health, protection of the environment and WHS, within the NSW local water utility context
- operators would only need to complete specific units of competency once. If units of competency have been completed during previous training such as Certificate II Water Industry Operations, or any of the additional skillsets, those units of competency do not need to be repeated
- where possible, delivery of units of competency will be clustered and repetition of knowledge mapped for training delivery. This will reduce potential repetition of learning for participants and provide minimise training delivery time while achieving competency
- where local water utilities have additional or varied needs outside the standard training program, suitable training and assessment programs may be developed, clearly demonstrating alignment to the competency benchmark
- operator competency requires more than formal training. Skills must be developed through formal and informal training and maintained to remain current over time. Other forms of learning

and gaining experience, such as mentoring, on-the-job learning and support from other staff are essential to developing and maintaining competency. Local water utilities should also plan for continuing professional development to foster ongoing career progression and currency.

4.3 Overview of competency benchmark training

The competency benchmark training is composed of four main elements:

1. **online induction modules**: Non-accredited courses developed by the industry to help water industry workers and contractors learn about their roles and responsibilities. This includes the aqua card, brown card, green card and future water operations WHS risk awareness card.

   These modules should be completed by all operators and can be extended to contractors and other technical staff exposed to risks but not performing operator job functions.

2. **safety training as required by WHS legislation**: Local water utilities must identify and complete the relevant units of competency that relate to the WHS risks faced by operators.

   Relevant training should be completed by all operators and can be extended to contractors and other technical staff exposed to risks but not performing operator job functions.

3. **fundamental operations training, including either water or wastewater treatment speciality**: Training covering the fundamental competencies needed by all operators. An operator completing fundamental training is eligible for a Certificate III Water Industry Operations.

   This training should be completed by all operators. This training covers the requirements for operators performing the water operator and wastewater operator job functions.

4. **advanced training in either water treatment, wastewater treatment or network operations**: Specialty accredited training for specific job tasks performed in complex water or wastewater treatment plants, or complex water or wastewater networks.

   This training should be completed by operators performing advanced water treatment, advanced wastewater/recycled water treatment or advanced networks job functions.

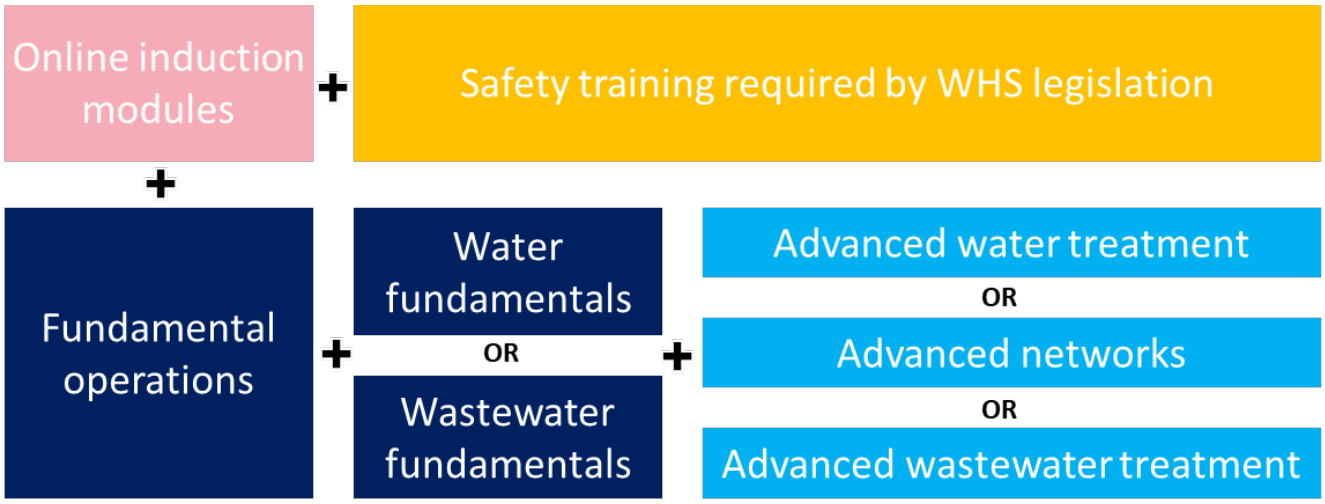

Figure 4 NSW local water utility operator competency benchmark

4.4 Online induction modules

The NSW Water Directorate has partnered with the Queensland Water Directorate in the development and delivery of online induction modules. These modules are based on the construction industry induction White Card training courses. The modules are non-accredited courses developed by the industry to help water industry workers and contractors learn about their roles and responsibilities when working on or near water, wastewater and recycled water assets.

These training modules apply to all operator job functions under the competency benchmark. This training should typically be completed within the few first weeks of operators starting work. These modules are also suitable as induction training for contractors and technical staff who may be exposed to risks but are not performing water operations job functions.

The awareness modules include:

- Aqua Card: online training course for operators working on or around drinking water infrastructure. Provides a simple overview of what contaminants are, the risks they pose, how they enter a drinking water system and the responsibilities of those working on drinking water infrastructure to reduce that risk. It includes practical guidance on how to operate within work sites including good housekeeping and disinfection practices.
- Brown Card: online training course for operators working in, on or near sewerage and recycled water assets. provides an overview of the importance of, and requirements for, maintaining public health, minimising environmental harm and general workplace health and safety. It includes topics like regulations and standards, risks and safety, managing health risks and specific types of work tasks.
- Green Card: online training course for operators working in, on or near water, sewerage and recycled water assets. It provides an overview of the importance of, and requirements for minimising environmental harm. Topics include environmental legislation and contaminants, incident awareness and preparedness, environmentally relevant activities, recycled water and biosolids.
- WHS awareness: online training course for operators working in, on or near water, sewerage and recycled water assets. It provides an overview of the common WHS risks faced by operators in performing the job functions, including highlighting of fatal risks. The training covers identification, management and reporting of risks. This module is currently under development. This training is not comprehensive and does not meet legislative requirements for employers, but gives an effective introduction to WHS risks and management before accredited WHS training is completed.

4.5 Work health and safety training

Local water utilities are responsible for understanding and responding to all relevant work health and safety requirements under NSW legislation, under guidance from SafeWork NSW.

The department expects that local water utilities identify and ensure completion of appropriate training. This should be completed in parallel with water operations technical training.

The department has identified four specific units of competency that are likely to be relevant for most local water utilities.

- Store and handle dangerous goods and hazardous substances (TLID0021)
- Work safely at heights (RIIWHS204E)
- Enter and work in confined spaces (RIIWHS202E)
- Control electrical risk on network pipes (NWPNET064)

Further guidance on recommended WHS units of competency is provided in *Section 7.4 Appendix D.*

4.6 Fundamentals training program

4.6.1 Overview of fundamentals training program

Fundamentals training covers the core awareness and operational skills needed by all operators. It aims to produce 'all-rounder' operators, capable of working across water, wastewater and network roles. It includes basic principles of network and treatment plant operations, and equips operators to work independently on simple networks, simple water systems and simple wastewater treatment plants such as oxidation ponds and trickling filters. Operators would need to complete further training to achieve competency for advanced treatment plant and advanced network job functions.

These training modules apply to all operator job functions under the competency benchmark. This training should typically be completed within 2 years of operators starting work.

Fundamentals training is composed of four elements:

- **policy and procedures**: Four units of competency covering WHS, environmental and public health risk management, and customer service for public water utilities. These units could be delivered and assessed in a classroom, by online learning, or a combination of both.
- **networks fundamentals**: Four units of competency covering monitoring and operation of water, wastewater and recycled water networks, including pump stations. These units incorporate significant practical training and would need to be delivered and assessed on site.
- **wastewater treatment fundamentals**: Three units of competency covering introduction and awareness of wastewater treatment processes, overview of digestion and disinfection, and solids handling. These units would typically be delivered by the department in a classroom environment and assessed on site.
- **water treatment fundamentals**: Three to five units of competency covering introduction and awareness of water treatment processes, basic chemical dosing, disinfection and management of critical control points. Some of these units would typically be delivered by the department in a classroom environment and assessed on site. Chlorine training would typically be delivered by RTOs with expertise in chlorine handling. Fluoride operator training is separately included for operators with this job function and must be delivered by a NSW Health approved training provider.

Operators should choose either the water or wastewater fundamentals training depending on job function. Operators whose job functions cover both water and wastewater can complete both the water and wastewater fundamentals units.

Operators completing the fundamentals training are eligible to be awarded a Certificate III Water Industry Operations.

The figure below describes the fundamental training program.

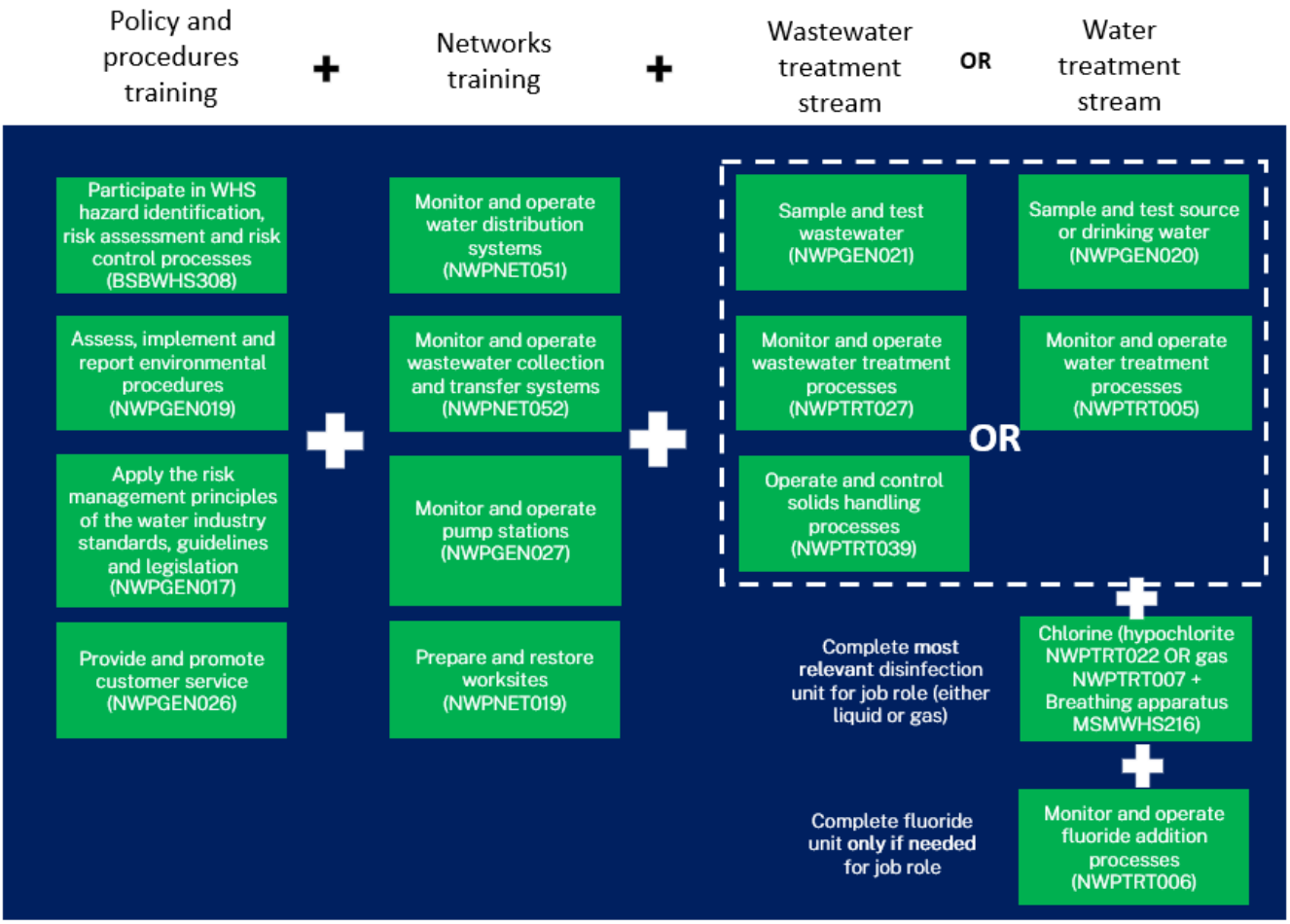

Figure 5 Overview of fundamentals training

Detailed description of the units of competency included in fundamentals training program are shown in *Section 7.5 Appendix E.* The appendix provides detail on each unit in the fundamentals training program, including notes on delivery and assessment.

Refer to *Section 7.9 Appendix I* for key to unit of competency codes.

4.6.2 Job functions addressed by fundamentals training program

The fundamentals training program should be completed by all operators.

Water operators working on low complexity systems, such as a groundwater source with limited chemical dosing such as chlorine disinfection and/or fluoride, would achieve appropriate

competency through the fundamentals training program without requiring the advanced training program. However, operators would still be required to complete any other specific units of competency relevant to their job functions.

Wastewater operators working on low complexity wastewater treatment systems, such as basic lagoon systems or trickling filter plants with limited chemical dosing or manual adjustment, would achieve appropriate competency through the fundamentals training program without requiring the advanced training program. However, operators would still be required to complete any other specific units of competency relevant to their job functions.

4.7 Advanced training program

4.7.1 Overview of advanced training program

The advanced training program builds on the fundamentals training program and provides the specific training needed to monitor and operate treatment process units in water and wastewater treatment plants and complete advanced network tasks such as high-pressure jetting.

These training modules apply to advanced water treatment, advanced wastewater/recycled water treatment and advanced network operator job functions under the competency benchmark. This training should be completed only after completing the fundamentals training program, typically 2 – 5 years after starting work.

The advanced training program is composed of three elective streams:

- advanced water treatment: Units of competency related to the process units found in water treatment plants
- advanced wastewater/recycled water treatment: Units of competency related to the process units found in wastewater treatment plants, plus a unit on reclaimed water use where relevant to the job function
- advanced network operations: Units of competency related to advanced inspection, operation, cleaning, maintenance and repair of water, wastewater and recycled water networks.

Operators should complete all units of competency specified in one elective stream and any other units of competency relevant to their job function. Operators working in roles with multiple job functions can complete multiple elective streams.

Operators completing the advanced water treatment or advanced wastewater treatment elective streams would be eligible to apply for Registered Operator Certification under the Water Industry Operator Registration Framework. Network operations are not currently recognised by this framework, but the department would consider completion of the advanced network operations elective stream as equivalent.

4.7.2 Advanced water treatment elective stream

Operators completing the advanced water treatment elective stream and relevant units of competency would have appropriate competency to operate complex water treatment plants.

The figure below demonstrates the advanced water treatment elective stream. Detailed description of the units of competency included in the advanced training program are shown in *Section 7.6 Appendix F*. The appendix provides detail on each unit in the training program, including notes on delivery and assessment.

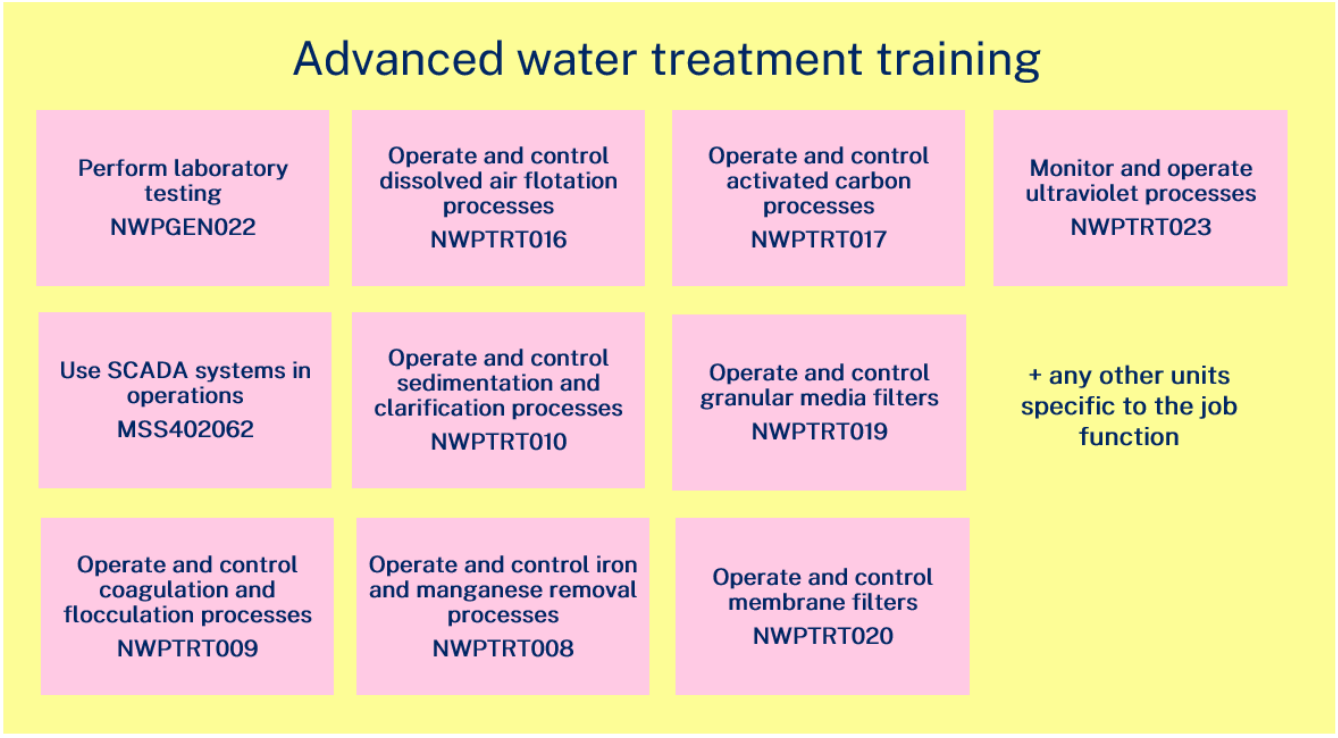

Figure 6 Overview of advanced water treatment elective stream

4.7.3 Advanced wastewater treatment elective stream

Operators completing the advanced wastewater treatment elective stream and relevant units of competency would have appropriate competency to operate complex wastewater treatment plants.

The following figure demonstrates the advanced wastewater treatment elective stream. Detailed description of the units of competency included in the advanced training program are shown in *Section 7.7 Appendix G*. The appendix provides detail on each unit in the training program, including notes on delivery and assessment.

Figure 7 Overview of advanced wastewater and/or recycled water treatment elective stream

4.7.4 Advanced networks elective stream

Operators completing the advanced networks elective stream and relevant units of competency would have appropriate competency to complete advanced water, wastewater and recycled water network tasks.

The advanced networks stream contains more units of competency than the advanced water and wastewater treatment streams, due to the larger number of advanced tasks completed by network operators. However at least four of these units are often completed as part of Certificate II traineeship programs, which would reduce the scope of the advanced training if previously completed.

The figure below demonstrates the advanced networks elective stream. Detailed description of the units of competency included in fundamentals training program are shown in *Section 7.8 Appendix H.* The appendix provides detail on each unit in the training program, including notes on delivery and assessment.

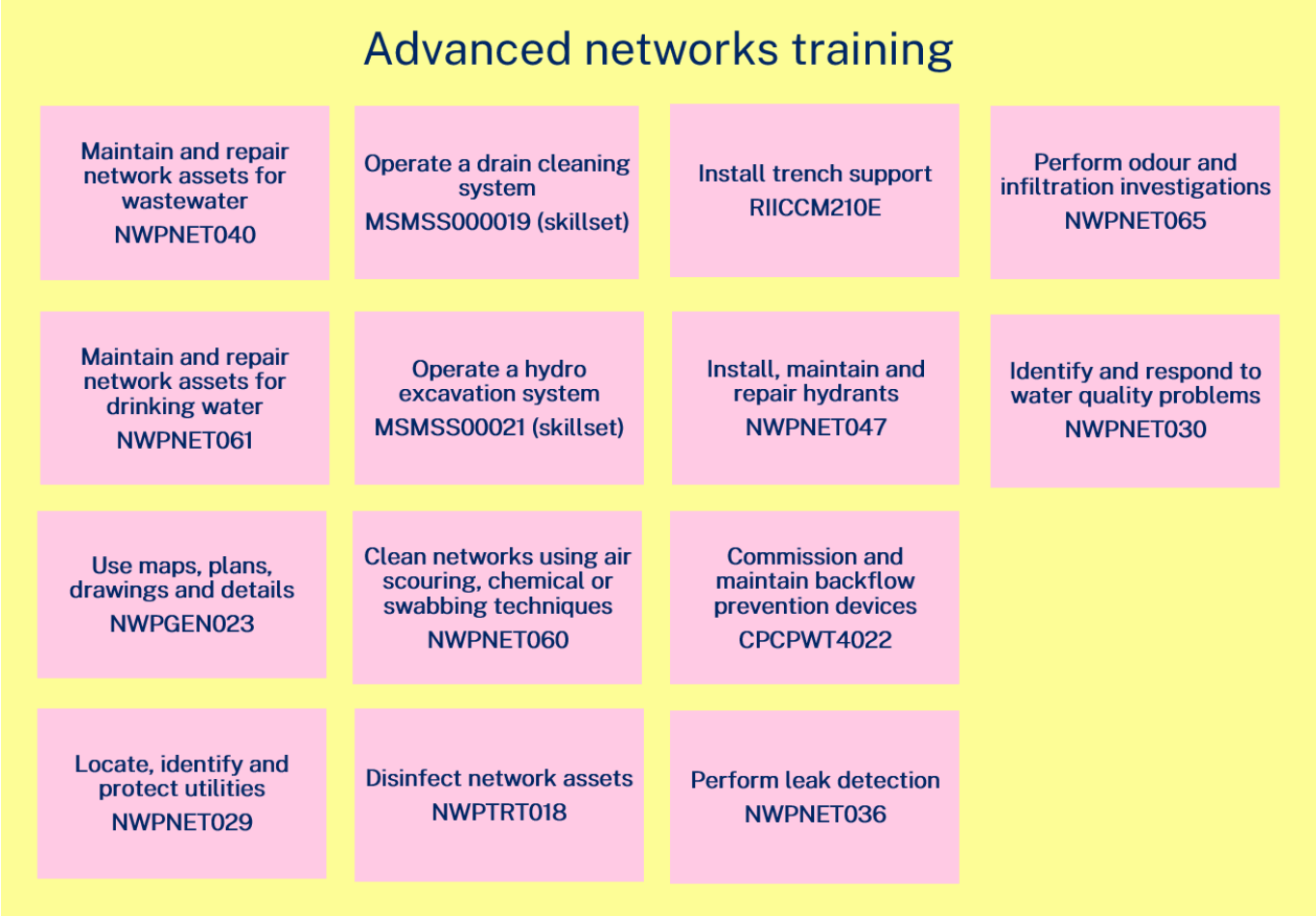

Figure 8 Overview of advanced networks elective stream

4.8 Training program quality assurance

The competency benchmark will ensure that operators receive quality training, relevant to their job functions and contextualised specifically for NSW local water utilities. This is vital to ensuring operators gain the skills needed to manage risks and to maintain industry confidence in the benchmark itself.

Assuring quality of training providers

Assuring the quality of training and assessment outcomes is a cornerstone of the VET system. The competency benchmark is based on delivery of accredited training delivered by RTOs in alignment with VET industry quality standards. RTOs are regulated by the Australian Skills Quality Authority (ASQA) and must meet specific quality assurance standards related to training course content and delivery, appropriate assessment, record keeping, student support and expertise of trainers.

The department is proposing to incorporate its existing technical training program into competency benchmark training. The department would partner with RTOs, providing experienced trainers and assessors and training course content to deliver accredited training.

Assuring quality of training program content

Quality of training content would be managed by documenting additional performance and knowledge requirements for each unit of competency (UOC) included in the training programs. These documents would describe the industry agreed underpinning skills and knowledge and for each unit of competency. An example of an expanded unit of competency document for the UOC NWPGEN021 - Sample and test wastewater is provided in *Section 7.10 Appendix J*.

Further detail could be provided by development of detailed curriculum documents, providing the specific learning requirements and methods of assessment for each UOC. Work performance specification documents would be developed for each UOC. These would be supported by learning specification documents, which identify the common knowledge and skills across multiple units of competency. This supports block delivery of multiple units in a single training deliver, increasing efficiency and effectiveness of training courses.

These documents would be made available to all RTOs delivering training, who would use them as the basis for developing a training delivery program. This would ensure consistency and relevance of training content and assessment regardless of who delivers it. Training will be consistent with the requirements of the NWP but will include additional content where needed to address the specific requirements of the sector.

Assuring quality and validity of assessment

Assessment requirements would form part of the work performance specifications documents. The competency benchmark would support moderation of assessment to ensure consistency in assessment judgements regardless of who completes the assessment.

Moderation of assessment sees training and assessment materials reviewed and agreed by water industry and VET experts. This would ensure consistency of assessment methods and judging competency.

Monitoring quality of training delivered to operators

The department would determine appropriate quality monitoring steps in partnership with the sector as the competency benchmark and associated training is implemented. Options for monitoring the quality of training include:

- centralised feedback on quality of training from operators
- review and audit of RTO training programs and delivery
- independent verification of operator competency by industry expert VET assessors who or panel assessment.

Independent verification of competency

The department proposes that initially, students completing training program aligned with the competency benchmark is considered ”competent”. Ongoing monitoring of the quality of training delivery may determine that independent quality assurance steps are needed in future.

Independent verification of competency is a verification process that assess whether the candidate has the skills and knowledge that they have been awarded by training providers. This verification process is a summative assessment, bringing together of all the skills, knowledge and understanding the candidate has gained throughout the period of learning, as well as the application of that learning in the workplace. Verification of competency is independent of RTO assessment.

Verification of competency is undertaken by independent, suitably qualified, industry-based assessors who either holds the VET assessor skill set (TAESS00019), or by panel assessment with a VET assessor making the assessment decision.

4.9 Maintenance of skills and competency

Operator competency requires more than formal training. To ensure operators remain competent over time, skills must be maintained through practice and supported by refresher training where required.

The competency benchmark would incorporate requirements for skills maintenance and ongoing demonstration of competency, such as a skills maintenance logbook. Operators that have not performed a task for a significant period of time would no longer be considered competent and would need some form of refresher training or reassessment before performing that task again. A review of competency and skills maintenance would be triggered when an operator changes job roles or moves to a different facility or different local water utility.

Effective management of skills maintenance would require some form of electronic training record or skills passport and require oversight and governance. Specific requirements for skills maintenance would be determined through implementation of the benchmark.

In addition to skills maintenance, local water utilities should also plan for continuing professional development for operators to foster ongoing development and career progression.

4.10 Competency benchmark governance

Effective leadership and governance is needed to ensure the competency benchmark remains effective and relevant to the local water utility sector. The department proposes that ownership and governance of the competency benchmark is held by the local water utility sector, in partnership with the NSW Government, to ensure the needs of the sector are heard and addressed.

The department would establish a governance committee with members from industry peak bodies, NSW Government regulators, vocational training experts and water operators.

The committee would be responsible for a range of governance issues, including:

- monitoring the quality of training delivery
- reviewing the scope and content of the competency benchmark
- supporting development of curriculum documents and moderation of assessment
- reviewing alignment with interstate and national training programs
- advising the department on implementation challenges

5 Implementation of the competency benchmark

5.1 The department's regulatory expectations

The department expects that all local water utilities would align training and development for their operators to the competency benchmark. New operators joining the industry should be trained consistent with the benchmark. Existing workers would have the opportunity to be recognised for existing skills through a Recognition of Prior Learning (RPL) process and be expected to complete gap training where needed.

The department will seek endorsement of the benchmark from NSW Health and NSW EPA as appropriate to demonstrate operator competency.

The department recognises the local water utilities and operators face significant challenges in availability of training, funding and workforce pressures. The department will take these issues into account when determining an appropriate timeline for implementing this expectation.

Expectations for individual operators

The department expects that local water utility operators develop and maintain competency in the skills required for the job functions they perform, consistent with the competency benchmark. This expectation will apply to all employees of local water utilities performing job functions described in the competency benchmark.

Training for new operators joining the industry should be consistent with the benchmark once training becomes available. Existing workers would have the opportunity to be recognised for existing skills through a RPL process and be expected to complete gap training where needed if additional skills and knowledge are identified to be required. This expectation will be consistent with the requirements for skills maintenance described in *Section 4.9.*

Expectations for local water utility employers

The competency benchmark would apply to local water utilities in NSW, covering:

- local government councils exercising water supply and sewerage functions under Division 2 Part 3 Chapter 6 of the *NSW Local Government Act 1993* [1]

[1] 1 A list of the local government councils exercising water supply functions under the Local Government Act 1993 is available at: www.industry.nsw.gov.au/water/water-utilities/local-water-utilities

- water supply authorities exercising water supply and sewerage functions under the NSW *Water Management Act 2000* [2]

The department expects local water utilities to resource operational teams appropriately to ensure that operators are competent for the job functions they perform, consistent with the competency benchmark.

The department expects local water utilities to integrate the competency benchmark into existing human resource management systems. Local water utilities should also develop a comprehensive learning and development program to support competency development.

The department proposes to adopt the framework presented in the *Water Operations Technical Competency Benchmark* published in 2023 by Water Research Australia. This document proposes a framework of outcomes and actions to support employers successfully manage learning and development. *Section 5.3* provides further details of this framework.

Monitoring and reporting on compliance

The department recognises that its expectation to address and implement the competency framework would not be readily achievable for many local water utilities without significant implementation support. The department will take a pragmatic approach to addressing compliance with the benchmark and seek to address barriers to implementation, such as availability of training, before firm regulatory requirements are considered.

The department initially proposes to monitor and report on compliance with the competency framework through annual performance reporting. Local water utilities would report on what proportion of their operational workforce address the competency benchmark relevant to their job function. This information would be published by the department.

As training programs mature and implementation support for the benchmark becomes available, the department would seek to enhance regulatory compliance requirements. Timelines for would be determined in partnership with the sector, taking into consideration the barriers to compliance faced by local water utilities.

Implementation of the competency benchmark would remain a key objective for the department as it supports local water utilities undertake strategic planning and workforce development activities.

5.2 Alignment with existing national approaches

Water Operations Technical Competency Benchmark

Water Research Australia is leading a national approach to operator learning and development through the publication of the Water Operations Technical Competency Benchmark. This document proposes a comprehensive approach to managing technical competency for operational staff in

[2] The following utilities are exercising water supply functions under the Water Management Act 2000: Central Coast Council, Cobar Water Board, Essential Energy, and WaterNSW for the Fish River Water Supply.

water utilities. This presents a framework of 12 elements grouped into three themes that address various aspects of learning and development frameworks. These are:

Theme 1: Technical competency systems and processes

- Element 1.1 Alignment of technical competency with Acts, Regulations, Guidelines
- Element 1.2 Alignment of technical competency with organisational goals and strategy
- Element 1.3 Integration of technical competency with organisational HR systems and processes

Theme 2: Developing and maintaining technical competency

- Element 2.1 Definition of water industry roles and responsibilities
- Element 2.2: Establishing minimum skills and knowledge requirements
- Element 2.3 Competency evaluation and training gap analysis
- Element 2.4 Site specific competency evaluation
- Element 2.5 Operator technical competency self-evaluation

Theme 3: Addressing specific needs and challenges

- Element 3.1 Process to evaluate and identify specific training needs
- Element 3.2 Selecting and engaging RTOs and training providers
- Element 3.3 Managing training budgets
- Element 3.4 Technology and digital literacy

The local water utility operator competency benchmark directly addresses elements 1.1, 2.1 and 2.2, and will provide resources and support for elements 2.3, 2.4, 2.5 and 3.2. The remaining elements would be addressed directly by local water utilities according to their local contexts.

The framework also includes a slimmed-down approach targeted towards small and remote water utilities. This approach focuses on the key elements of the framework and would be suitable for many local water utilities.

Water Industry Operator Registration Framework

The Water Industry Operator Registration Framework provides a set of nationally consistent criteria that define and recognise the minimum level of competency and capability required by those operators who manage the treatment of water, wastewater and/or recycled water to ensure that the final product does not have an adverse impact on public health or the environment, and that its quality is fit for purpose and safe to use. The registration program and registration of operators is managed by the Water Industry Operations Association of Australia (WIOA).

The competency benchmark has been designed to align with the registration framework. Operators completing the advanced water treatment or advanced wastewater treatment elective streams would be eligible to apply for Registered Operator Certification under the Water Industry Operator Registration Framework. Network operations are not currently recognised, but the department would consider completion of the advanced network operations elective stream as equivalent.

5.3 Implementation actions and support

The department acknowledges that implementing the competency benchmark, especially the changes to training delivery, are unachievable without ongoing support, funding, resources and sector collaboration.

The department would develop a specific implementation plan for the competency benchmark once it has been finalised. Feedback from the sector will be vital to ensuring this implementation plan identifies and addresses key barriers.

The implementation plan would address:

- development of curriculum resources relevant to the sector
- cost of training to local water utilities
- eligibility of training for subsidies
- labour shortage pressures and releasing operators for training
- availability and competency of trainers to deliver training
- regional partnerships for training delivery
- suitable locations for training delivery and assessment across regional NSW
- integration of the competency benchmark into learning and development programs
- records management, including electronic training records or skills passports.

The department is seeking feedback from the sector on the specific implementation challenges and needs.

6 How to have your say

The competency benchmark for local water utility operators in NSW would help to address the critical shortage of trained water operators and work towards establishing a sustainable water operations training market in the state.

The department is seeking both general comments and specific feedback on the competency benchmark. Feedback may include level of industry support for the competency benchmark, potential challenges, opportunities for improvement and levels/types of support and resources required from NSW Government for successful.

We would like to hear from local water utilities (especially water operators, managers and human resources staff), water industry more broadly, education and training industry and any other interested stakeholders.

Consultation will be open for a period of 6 weeks, from **3 July 2024 to 23 August 2024**.

There are multiple ways to have your say.

Attend a webinar to hear from the project team, ask questions and provide comments

- Date: 3 July 2024, time 10.30 am – 11.30 am: Register here

Fill out a questionnaire

- This online survey has specific questions to guide your submission

Contact the department directly

- regional.town.water@dpie.nsw.gov.au.

We will come to you

- We will reach out to Joint Organisations, Water Utility Alliances, and other groups to look for opportunities for us to attend your meetings to hear directly from you. Alternatively, if you would like us to come along to a meeting or have a direct discussion with you and your colleagues, please contact us and we will arrange a suitable time:

regional.town.water@dpie.nsw.gov.au.

Consultation questions

1. Which part of the sector do you represent?
    a. Local water utility operator
    b. Other local water utility staff
    c. Joint Organisation / regional alliance or similar
    d. Industry body or representative organisation
    e. Industry consultant

f. Registered training organisation

g. NSW Government agency

h. Other (please specify)

General questions

2. Do you generally support the competency benchmark proposed for local water utilities? Yes/No
3. Do you think the competency benchmark will support increased demand for and supply of quality training for local water utilities? Yes/no
4. Do you think the competency benchmark will help address workforce development challenges in the local water utility sector? Yes/no
5. Would you support water operations seeking to become a recognised trade in future? Yes/no

Questions on proposed training program content and structure

6. Do you support the inclusion of industry developed online induction modules? Yes/No
7. Do you support the inclusion of fundamentals training common to all operators? Yes/No
8. Do you support the inclusion of fixed units of competency in advanced training modules? Yes/No
9. Do you have any comments on the training program structure or units of competency specified?

Questions on training quality assurance

10. Do you support specifying additional skills and knowledge and assessment requirements needed by local water utility operators, over and above the National Water Training Package? Yes/no
11. Do you have any comments on methods to ensure training program quality?

Questions on implementing of the competency benchmark

12. Do you support the department setting an expectation that all local water utilities address the competency benchmark? Yes/No
13. Do you think the competency benchmark should apply to existing operators, provided they can have existing skills and qualifications recognised? Yes/no
14. Do you think the cost of training will be a barrier to implementing the benchmark? Yes/no
15. What are the key barriers faced by local water utilities to implementing the benchmark?
16. What support would local water utilities need to successfully implement the benchmark?
17. What support would registered training organisations need to deliver training aligned with the competency benchmark?

General feedback

18. Do you have any other feedback on the competency benchmark?

7 Appendices

7.1 Appendix A Comparison with trade qualifications

The volume of learning for qualifications comparable to Certificate III Water Industry Operations, are provided below. Volume of learning for the fundamental training within the competency benchmark has been estimated. This may be updated once the details of the competency benchmark are finalised.

Table 1 Comparison of Certificate III Water Industry Operations with trade qualifications

Qualification	Industry area	Total units of competency (UOC)	Core units	Elective units	Nominal term direct entry	Volume of Learning Hours	Trade qualification	Additional information
Certificate III Water Industry Operations (NWP30222)	Commercial / community water supply	11	2	9	24 months	450-474	NO	Currently delivered under Smart and Skilled in NSW
Competency benchmark fundamentals training program Aligned to Certificate III Water Industry Operations (NWP30222)	Commercial / community water supply	11-13	8	3-5 depending on stream choice and job function	24 months	615 - 735	NO	Volume of learning estimated based on expectations for UOC delivery under the competency benchmark

Qualification	Industry area	Total units of competency (UOC)	Core units	Elective units	Nominal term direct entry	Volume of Learning Hours	Trade qualification	Additional information
Competency benchmark fundamentals + one advanced elective stream **Aligned to Certificate III Water Industry Operations (NWP30222) + additional UOCs**	Commercial / community water supply	20 - 26	11 - 13	9 – 18 depending on stream choice and job function	36 – 48 Months	1125-1305	Equivalent	Volume of learning estimated based on expectations for UOC delivery under the competency benchmark. Volume of learning and UOCs chosen to be equivalent to a trade level qualification. May be considered for conversion to trade in future.
Certificate III Gas Supply Industry Operations **(UEG 30122)**	Industrial gas supply	18	6	10 gas specific 2 non-specific	36 months	1226 hours	YES	Similar to water network electives mainly industry based. Was a traineeship, now a trade.
Certificate III Parks and Gardens **(AHC31021)**	Horticulture	16	11	4 specific 1 non-specific	48 months	1002-1055	YES	Used by local government

Qualification	Industry area	Total units of competency (UOC)	Core units	Elective units	Nominal term direct entry	Volume of Learning Hours	Trade qualification	Additional information
Certificate III in Plumbing (CPC32420)	General plumbing	58	43	15 of which 4 can be non-specific	48 months	1810 hours	YES	This is the minimum number of UOC of the streams available. Core UOC include UOC not directly related to the job function. Different streams have more UOC required and different packaging rules
Certificate III in ESI - Distribution Overhead (UET30621)	Electrical industry - Overhead linework (utilities)	24	20	4 ESI specific 1 of which can be non-specific	48 months	900 hours	YES	Was a traineeship now a trade
Certificate III in ESI - Distribution Underground (UET30821)	Electrical industry - Distribution Underground Cable Jointer (utilities)	23	18	5 ESI and 2 can be non-specific	48 months	900 hours	YES	Was a traineeship, now a trade

Qualification	Industry area	Total units of competency (UOC)	Core units	Elective units	Nominal term direct entry	Volume of Learning Hours	Trade qualification	Additional information
Certificate III in Electrotechnology Electrician (UEE30820)	Electrician (licenced)	1110 weighted points	990 points	120 of which 40 can be non-specific	48 months	1040 hours	YES	Industry UOC points range from 20 to 80 points. Capstone assessment required to receive a licence to trade. Licence to trade issued by NSW Government. New capstone assessments will be independent of the qualification and conducted by a relevant industry body recognised by Government.

7.2 Appendix B Scope of consultation

The list below provides a list of organisations that have taken part in targeted consultation during development of the competency benchmark. This list does not capture organisations that have participated in webinars or other public forms of consultation.

Local water utilities:
Goulburn Mulwaree Council
Inverell Shire Council
Liverpool Plains Shire Council
Riverina Water
Tweed Shire Council
Bega Valley Council
Narromine Shire Council
MidCoast Council
Parkes Shire Council
Cowra Council
Kempsey Shire Council
Port Macquarie-Hastings Council
AlburyCity Council
Clarence Valley Council
Lachlan Valley Council

Joint organisations and water utility alliances:
Central NSW Joint Organisation
Orana Water Utilities Alliance
Southeast NSW water utilities

Government agencies or departments:
Local Government NSW

NSW Public Sector Industry Training Advisory Body

NSW Department of Education (Training Services NSW)

NSW Health

NSW Environment Protection Authority

Registered training organisations:
Fusion Training Solutions

Trility

Simmonds & Bristow

TAFE NSW

TAFE SA

Water Training Australia

Water industry associations (state and national):
NSW Water Directorate
Qld Water Directorate
Vic Water
Water Industry Operators Association of Australia (WIOA)
Water Research Australia
Australian Water Association (AWA)
Water Services Association of Australia (WSAA)
Water Industry Skills and Training and Network (WTAN)

Industry experts:
Murray Thompson Water Services
United Services Union

State-owned corporations and private companies:
Sydney Water Corporation
Hunter Water Corporation
Veolia

7.3 Appendix C Recommended additional work-related activity units of competency

Table 2 Recommended additional NWP and work-related activity units of competency

Unit Code	Unit description	Training package
AHCOCM401 OR AHCILM201	Protect places of cultural significance OR Maintain cultural places.	Agriculture, Horticulture, Conservation Land Management Training Package *Note; at operator level, this is already covered in the Environmental Unit NWPGEN019*
AHCSAW203	Conduct erosion and sediment control activities	Agriculture, Horticulture, Conservation Land Management Training Package
CPCCDE3014	Remove non-friable asbestos	Construction, Plumbing and Services Training Package
CPCCLDG3001	Licence to perform dogging	Construction, Plumbing and Services Training Package
NSW FE	NSW Health Fluoridation Code of Practice Operator Certificate,	NSW Fluoridation Regulations 20217
NWPNET038	Install metering equipment	National Water Training Package
NWPNET063	Use digital imaging equipment in the field	National Water Training Package
NWPCAD003	Identify and confirm blue-green algae outbreaks	National Water Training Package
RIISAM203E	Use hand and power tools	Transport and Logistics Training Package
RIISAM204E	Operate small plant and equipment	Resources and Infrastructure Industry Training Package
RIISS00054	Traffic controller skill set	Resources and Infrastructure Industry Training Package

Unit Code	Unit description	Training package
RIISS00055	Traffic Management Implementer Skill Set	Resources and Infrastructure Industry Training Package
TLILIC0022	Licence to operate a slewing mobile crane (up to 20 tonnes)	Transport and Logistics
TLID1001	Shift materials safely using manual handling methods	Transport and Logistics
TLID2010A	Operate a forklift	Transport and Logistics Training Package
TLIF2012	Apply safe procedures when transporting dangerous goods or explosives.	Transport and Logistics Training Package

Table 3 Recommended dam safety and surveillance units of competency

Unit Code	Unit description	Training package
NWPCAD003	Identify and confirm blue-green algae outbreaks	National Water Training Package
NWPCAD007	Inspect, operate and maintain low consequence dams	National Water Training Package
NWPCAD008	Monitor and control dam operations	National Water Training Package
NWPCAD009	Monitor and implement dam maintenance	National Water Training Package
NWPCAD010	Inspect and report on concrete dam safety	National Water Training Package
NWPCAD011	Inspect and report on embankment dam safety	National Water Training Package
NWPCAD013	Conduct and report dam safety instrumentation monitoring	National Water Training Package
NWPCAD019	Monitor and operate groundwater extraction	National Water Training Package

Unit Code	Unit description	Training package
NWPCAD024	Implement dam safety plans	National Water Training Package

7.4 Appendix D Recommended WHS units of competency

Table 4 Recommended WHS units of competency

Unit Code	Unit description	Training package
HLTAID009	Provide cardiopulmonary resuscitation	Utilities, Electrical Transmission, Distribution and Rail Sector
HLTAID010	Provide basic emergency life support	Utilities, Electrical Transmission, Distribution and Rail Sector
HLTAID011	Provide First Aid	Utilities, Electrical Transmission, Distribution and Rail Sector
CPCCDE3014	Remove non-friable asbestos	Construction, Plumbing and Services Training Package
CPCCLDG3001	Licence to perform dogging	Construction, Plumbing and Services Training Package
MSMWHS216	Operate Breathing Apparatus	Manufacturing Training Package
NWPNET064 *3	Control electrical risk on network pipes	National Water Package
RIIWHS204E *3	Work safely at heights	Resources and Infrastructure Industry Training Package
RIIWHS202E *3	Enter and work in confined spaces	Resources and Infrastructure Industry Training Package
RIIWHS302E	Implement traffic management plans	Resources and Infrastructure Industry Training Package
TLID0021 *3	Store and handle dangerous goods and hazardous substances	Transport and Logistics Training Package
TLIF2010	Apply fatigue management strategies	Transport and Logistics Training Package
UETDREL006	Work safely in the vicinity of live electrical apparatus as a non-electrical worker (aligns with the Essential Energy course)	Utilities, Electrical Transmission, Distribution and Rail Sector

Unit Code	Unit description	Training package
UETDRMP001	Apply access authority procedures to work on or near electrical apparatus also has a pre-requisite (this will align to the Essential Energy Course depending on the work scope).	Utilities, Electrical Transmission, Distribution and Rail Sector
UETDRMP002	ESI safety rules for work on, near or in the vicinity of electrical apparatus (aligns with the EE course depending upon scope of work)	Utilities, Electrical Transmission, Distribution and Rail Sector
UETDRMP007	Perform rescue from a live low voltage panel Pre-requisite Unit: HLTAID009 Provide cardiopulmonary resuscitation and UEECD0007: Apply WHS regulations, codes, and practices in the workplace or UETDREL006 Work safely in the vicinity of live electrical apparatus as a non-electrical worker)	Utilities, Electrical Transmission, Distribution and Rail Sector
UEERL0004	UEERL0004 - Disconnect - reconnect electrical equipment connected to low voltage (LV) installation wiring (only for licenced electricians or mechanical fitters where the work is incidental or peripheral to the work of the job)	Utilities, Electrical Transmission, Distribution and Rail Sector

**3 Recommended in parallel with fundamental training program*

7.5 Appendix E Fundamental training program

Table 5 Fundamental training program

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
1	BSBWHS308 Participate in WHS Hazard Identification, risk assessment and risk control processes	Cert III core unit	Required by all operators	Typically delivered by RTOs with classroom or online assessment.	This unit describes the skills and knowledge required to participate in the processes of work health and safety (WHS) hazard identification, risk assessment and risk control. It includes participating in worker consultation and support to contribute to a healthy and safe workplace.	This unit applies to those who assist with identifying workplace hazards and assessing and controlling WHS risks as part of their WHS responsibilities, which are in addition to their main duties.

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
2	NWPGEN019 Assess, implement and report environmental procedures	Cert III core unit	Required by all operators	Typically delivered by RTOs with classroom or online assessment.	This unit includes assessing environmental requirements of specific projects or worksites and reviewing the application of environmental procedures. It also includes identifying and minimising the environmental impact of industry work activities, identifying general environmental risks and monitoring environmental procedures.	Those undertaking this unit would work under indirect supervision, while performing mostly specific tasks in a range of contexts.

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
3	NWPGEN017 Apply the risk management principles of the water industry standards, guidelines and legislation	Cert III Group E: Treatment: Water and wastewater Cert II General elective units	Required by all operators unless previously completed	Typically delivered by RTOs with classroom or online assessment.	This unit includes identifying relevant guidelines of the water industry, describing risk management principles for the control of contaminants in the water cycle, applying principles to work context and reviewing and evaluating water quality management principles. It also includes complying with risk management principles established in relevant guidelines for the water industry which contribute to the improved management of water supply systems and the reduction of water quality risks.	This unit supports the attainment of skills and knowledge required for those working in all roles in the water industry. Those undertaking this unit would work under appropriate supervision, while performing routine tasks in a range of contexts.

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
4	NWPGEN026 Provide and promote customer service	Cert III Group H: General elective units	Required by all operators	Typically delivered by RTOs with classroom or online assessment.	This unit includes responding effectively to the needs of internal and external customers by the application of the organisation's standards and processes. The ability to solve problems, communicate effectively and seek opportunities to improve service to customers is essential to performance. *This training would include specific examples of Council's; vision/goals/strategy, water &wastewater customer service plans, standards & on-call responses, Delivery Program, Operational Plan, community strategic plan & consumer service policy/procedures.*	This unit applies to field staff with specific responsibility for the provision of customer service to customers and suppliers of the organisation. Those undertaking this unit work under supervision, while performing routine tasks in a familiar context.

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
5	NWPNET051 Monitor and operate water distribution systems	Cert III Group D: Networks	Required by all operators	Typically delivered by RTOs with onsite assessment.	This unit includes coordinating the operation of bulk water or water distribution systems and measuring and reporting on the operation of the system. It also includes interpreting technical documentation, identifying and investigating operational problems and collecting and analysing technical information.	This unit applies to those working as field staff and operators with a specific responsibility for inspecting and measuring the performance of bulk water or water distribution systems and for ensuring that flow, pressure and volume parameters are regulated according to organisational specifications and system demands. Those undertaking this unit would work under appropriate supervision, while performing routine tasks, in a familiar context, and ensuring minimum damage to the environment.

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
6	NWPNET052 Monitor and operate wastewater collection and transfer systems	Cert III Group D: Networks	Required by all operators	Typically delivered by RTOs with onsite assessment.	This unit includes measuring and reporting on the operation of the system. It also includes interpreting technical documentation, identifying and investigating operational problems and collecting and analysing technical information.	This unit applies to those working as field staff and operators with a specific responsibility for inspecting and measuring the performance of wastewater collection and/or wastewater transfer systems and for ensuring that flows are regulated according to organisational specifications and system demands. Those undertaking this unit would work under appropriate supervision, while performing routine tasks, in a familiar context, and ensuring minimum damage to the environment.
7	NWPGEN027 Monitor and operate pump stations	Cert III Group D: Networks Cert II General elective	Required by all operators unless previously completed	Typically delivered by RTOs with onsite assessment.	This unit includes pump stations in water and wastewater systems, undertaking minor maintenance or organising more complex maintenance. It also includes gland adjusting, packing replacement and replacing fittings.	This unit applies to staff with specific responsibility for ensuring pump stations operate according to workplace procedures. Those undertaking this unit would work under appropriate supervision, while performing routine tasks in a familiar context, ensuring minimal damage to the environment.

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
8	NWPNET019 Prepare and restore worksite	Cert III Group H: General elective Cert II General elective units	Required by all operators unless previously completed	Typically delivered by RTOs with onsite assessment.	This unit includes following work instructions, using a range of equipment and tools to prepare a safe worksite and restoring worksite to the required condition.	This unit applies to those working as field and operational staff performing a wide range of functions and supporting construction, maintenance, and operations processes. Those undertaking this unit would work under appropriate supervision, performing routine tasks, in mostly familiar contexts.
9	NWPGEN021 Sample and test wastewater	Cert III Group F: Wastewater treatment Cert II General elective units	Required if completing wastewater stream, unless previously completed. Optional if completing water stream.	Typically delivered by the department in partnership with RTOs. Onsite assessment.	This unit includes preparing for and conducting wastewater sampling and testing and finalising work. It also includes collecting and preparing wastewater samples and performing wastewater tests. This unit does not include off-site laboratory testing.	This unit applies to those working in field operations in industries. Those undertaking this unit would work under appropriate supervision, while performing routine tasks in a range of familiar contexts.

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
10	NWPTRT027 Monitor and operate wastewater treatment processes	Cert III Group H: General electives Cert II General elective units	Required if completing wastewater stream, unless previously completed. Optional if completing water stream.	Typically delivered by the department in partnership with RTOs. Onsite assessment.	This unit includes monitoring and operating wastewater treatment plants, reporting system performance and process quality control. It also includes ensuring wastewater disposal or re-use meets state or territory legislative requirements	This unit applies to operational staff in wastewater treatment plants with responsibility for the practical and safe operation of plant, equipment and processes. Those undertaking this unit would work under appropriate supervision, performing routine tasks within a familiar context.
11	NWPTRT039 Operate and control solids handling processes	Cert III Group F: Wastewater treatment	Required if completing wastewater stream. Optional if completing water stream.	Typically delivered by the department in partnership with RTOs. Onsite assessment.	This unit includes monitoring water, wastewater dewatering, sludge thickening plant and measuring and reporting on system performance and process quality control. It also includes identifying faults, determining and applying technical adjustments and conducting chemical dosing procedures.	This unit applies to operational staff with a specific responsibility for water or wastewater dewatering and sludge thickening processes in a treatment plant. Those undertaking this unit would work under appropriate supervision, while performing routine tasks within a familiar context.

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
12	NWPGEN020 Sample and test source or drinking water	Cert III Group G: Water treatment Cert II General elective units	Required if completing water stream, unless previously completed. Optional if completing wastewater stream.	Typically delivered by the department in partnership with RTOs. Onsite assessment.	This unit includes preparing for and conducting worksite source and treated water quality sampling and testing. It also includes reporting abnormal findings and finalising work. This unit does not include off-site laboratory testing	This unit applies to those working in field operations in various industries. Those undertaking this unit would work under appropriate supervision, while performing routine tasks in a range of familiar contexts.
13	NWPTRT005 Monitor and operate water treatment processes	Cert III Group H: General electives Cert II General elective units	Required if completing water stream, unless previously completed. Optional if completing wastewater stream.	Typically delivered by the department in partnership with RTOs. Onsite assessment.	This unit includes reporting on water treatment plant system performance and processing quality control. It also includes operating water treatment processes, and complying with relevant legislation, regulations and guidelines	This unit applies to operational staff in water treatment plants with responsibility for the practical and safe operation of plant, equipment and processes. Those undertaking this unit would work under appropriate supervision, while performing routine tasks, within a familiar context.

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
14	NWPTRT022 Monitor and operate hypochlorite disinfection processes	Cert III Group H General electives Cert II General elective units	Required if completing water stream and included in job function, unless previously completed. Can complete chlorine gas module instead/as well, if included in job function. Optional if completing wastewater stream.	Typically delivered by RTOs with onsite assessment.	This unit includes monitoring hypochlorite disinfection systems and reporting on process quality control. It also includes working safely with, transporting and storing sodium hypochlorite solution or calcium hypochlorite solids and implementing emergency response procedures.	This unit applies to operational staff with specific responsibility for hypochlorite disinfection systems in water or wastewater treatment plants. Those undertaking this unit would work under appropriate supervision, while performing routine tasks, in a range of familiar contexts.

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
15	NWPTRT007 Monitor and operate liquefied chlorine gas disinfection processes	Cert III Group H General electives Cert II General elective units	Required if completing water stream and included in job function, unless previously completed. Can complete hypochlorite module instead/as well, if included in job function. Optional if completing wastewater stream.	MSMWHS216 Operate breathing apparatus is pre-requisite to this unit, often delivered in conjunction. Typically delivered by RTOs with onsite assessment.	This unit includes preparing to work with liquefied chlorine gas and performing liquefied chlorine gas container changeover procedures. It also includes completing documentation, reporting on process quality control and working safely. It also includes using self-contained breathing apparatus.	This unit applies to operational staff with specific responsibility for disconnecting and connecting liquefied chlorine gas containers in water and wastewater treatment plants. Those undertaking this unit would work under appropriate supervision, while performing routine tasks, in a range of familiar contexts.

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
16	MSMWHS216 Operate breathing apparatus	Cert III General electives Cert II General electives	Required if completing water stream and included in job function, unless previously completed. Optional if completing wastewater stream.	Pre-requisite to NWPTRT007, often delivered in conjunction. Typically delivered by RTOs with onsite assessment.	This unit of competency covers the skills and knowledge required to operate and maintain breathing apparatus and equipment in an irrespirable atmosphere, as defined by the Australian Standard AS/NZS 1715:2009 Selection, use and maintenance of respiratory protective equipment. This unit applies to those working in industry under appropriate supervision, while performing complex tasks in a range of contexts.	This unit of competency applies to operators who are required to wear breathing apparatus because they are working: in a confined space, with hazardous gases/vapours, in an oxygen deficient atmosphere, in other situations requiring the wearing of breathing apparatus. Operators may also be required to wear breathing apparatus in emergency situations; however, this is not the prime focus of this unit. This unit of competency applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, as appropriate.

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
17	NWPTRT006 Monitor and operate fluoride addition processes	Cert III Group H General elective Cert II General elective units	Required if completing water stream and included in job function, unless previously completed.	Must be delivered by a NSW Health approved training provider. Typically includes both classroom and onsite assessment.	This unit includes preparing for fluoridation processes, applying fluoride dosing and reporting on water quality control.	This unit applies to those working as water operators responsible for fluoridation processes in water treatment. Those undertaking this unit would work under appropriate supervision, while performing routine tasks, in a range of familiar contexts.

7.6 Appendix F Advanced water treatment plant training program

Table 6 Advanced water treatment plant training program

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
1	NWPGEN022 Perform laboratory testing	Cert III Group F: Wastewater treatment Cert III Group G: Water treatment	Required unless previously completed	Also included in wastewater treatment skillset. Onsite assessment	This unit includes performing laboratory tests using standard methods and procedures, using and calibrating equipment and preserving the integrity of samples. It also includes performing calculations and identifying and reporting discrepancies.	This unit applies to those working in industry under appropriate supervision, while performing complex tasks in a range of contexts.

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
2	MSS402062 Use SCADA systems in operations	Manufacturing training package	Required unless previously completed	Also included in wastewater treatment skillset. Classroom and scenario software assessment	This unit applies to an individual who is required to access the Supervisory Control and Data Aquisition (SCADA) type system as part of their routine work and take action, in accordance with procedures, based on information they obtain from the system.	This unit applies to any organisation that uses a SCADA or similar system
3	NWPTRT009 Operate and control coagulation and flocculation processes	Cert III Group G: Water treatment	Required to complete this skill set	Onsite assessment	This unit includes monitoring, measuring and reporting on system performance and quality control. It also includes identifying faults, determining and applying technical adjustments and conducting chemical dosing procedures	This unit applies to operational staff with a specific responsibility for coagulation and flocculation processes in water and wastewater plants. Those undertaking this unit would work under appropriate supervision, while performing routine tasks, within a familiar context.

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
4	NWPTRT016 Operate and control dissolved air flotation processes	Cert III Group F: Wastewater treatment Cert III Group G: Water treatment	Required to complete this skillset	Onsite assessment	This unit includes measuring and reporting on system performance and processing quality control of DAF processes. It also includes identifying faults, determining and applying process adjustments and producing reports.	This unit applies to those working as operational staff with a specific responsibility for DAF processes. Those undertaking this unit would work under appropriate supervision, while performing routine tasks, within a familiar context.
5	NWPTRT010 Operate and control sedimentation and clarification processes	Cert III Group F: Wastewater treatment Cert III Group G: Water treatment	Required unless previously completed	Also included in wastewater treatment skillset. Onsite assessment	This unit includes monitoring sedimentation and clarification plant measuring and reporting on system performance and process quality control. It also includes identifying faults, determining and applying adjustments, conducting chemical dosing procedures and producing reports.	This unit applies to operational staff with a specific responsibility for sediment and clarification processes in water treatment plants. Those undertaking this unit would work under appropriate supervision, while performing routine tasks, within a range of familiar contexts.

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
6	NWPTRT008 Operate and control iron and manganese removal processes	Cert III Group G: Water treatment	Required to complete this skillset	Onsite assessment	This unit includes identifying faults, applying process adjustments, following instructions and reporting on processes	This unit applies to operational staff with specific responsibility for ensuring UV irradiation disinfection systems comply with workplace requirements. Those undertaking this unit would work under appropriate supervision while performing routine tasks in a range of familiar contexts.
7	NWPTRT017 Operate and control activated carbon processes	Cert III Group G: Water treatment	Required to complete this skillset	Onsite assessment	This unit includes identifying faults, determining and applying adjustments and completing documentation	This unit applies to those working as operational staff in treatment. Those undertaking this unit would work under appropriate supervision, while performing routine tasks, within a familiar context.

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
8	NWPTRT019 Operate and control granular media filters	Cert III Group F: Wastewater treatment Cert III Group G: Water treatment	Required to complete this skillset	Onsite assessment	This unit includes monitoring granular media filtration plants, measuring and reporting on system performance and processing quality control. It also includes identifying faults, determining and applying technical adjustments and conducting chemical dosing procedures	This unit applies to operational staff with a specific responsibility for granular media filtration processes in treatment plants. Those undertaking this unit would work under appropriate supervision, while performing routine tasks, within a familiar context.
9	NWPTRT020 Operate and control membrane filters	Cert III Group F: Wastewater treatment Cert III Group G: Water treatment	Required to complete this skillset	Onsite assessment	This unit includes monitoring membrane filtration plant, microfiltration, ultrafiltration and nanofiltration, measuring and reporting on system performance and processing quality control. It also includes identifying faults, determining and applying adjustments and conducting chemical procedures	This unit applies to operational staff members with a specific responsibility for membrane filtration processes in treatment plants. Those undertaking this unit would work under appropriate supervision, while performing routine tasks, within a familiar context.

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
10	NWPTRT023 Monitor and operate ultraviolet processes	Cert III Group H: General elective units Cert II General elective units	Required unless previously completed	Also included in wastewater treatment skillset. Onsite assessment	This unit includes preparing and maintaining UV irradiation disinfection processes and reporting on microbiological quality control.	This unit applies to operational staff with specific responsibility for ensuring UV irradiation disinfection systems comply with workplace requirements. Those undertaking this unit would work under appropriate supervision while performing routine tasks in a range of familiar contexts.

7.7 Appendix G Advanced wastewater and/or recycled water treatment plant training program

Table 7 Advanced wastewater and/or recycled water treatment plant training program

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
1	NWPGEN022 Perform laboratory testing	Cert III Group F: Wastewater treatment Cert III Group G: Water treatment	Required unless previously completed	Also included in water treatment skillset. Onsite assessment	This unit includes performing laboratory tests using standard methods and procedures, using and calibrating equipment and preserving the integrity of samples. It also includes performing calculations and identifying and reporting discrepancies.	This unit applies to those working in industry under appropriate supervision, while performing complex tasks in a range of contexts.
2	MSS402062 Use SCADA systems in operations	Manufacturing training package	Required unless previously completed	Also included in water treatment skillset. Classroom and scenario software assessment	This unit applies to an individual who is required to access the SCADA type system as part of their routine work and take action, in accordance with procedures, based on information they obtain from the system.	This unit applies to any organisation that uses a SCADA or similar system

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
3	NWPTRT010 Operate and control sedimentation and clarification processes	Cert III Group F: Wastewater treatment Cert III Group G: Water treatment	Only required if within job function, unless previously completed	Also included in water treatment skillset. Onsite assessment	This unit includes monitoring sedimentation and clarification plant measuring and reporting on system performance and process quality control. It also includes identifying faults, determining and applying adjustments, conducting chemical dosing procedures and producing reports.	This unit applies to operational staff with a specific responsibility for sediment and clarification processes in water treatment plants. Those undertaking this unit would work under appropriate supervision, while performing routine tasks, within a range of familiar contexts.
4	NWPTRT040 Operate and control digestion processes	Cert III Group F: Wastewater treatment	Only required if within job function	Onsite assessment	This unit includes reporting on system performance within domestic and industrial wastewater treatment plants. It also includes conducting inspections, identifying process faults and collecting samples.	This unit applies to operational staff with specific responsibility for operating anaerobic processes in treatment plants and checking that the processes comply with organisational requirements. Those undertaking this unit would work under appropriate supervision, performing routine tasks within a familiar context.

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
5	NWPTRT036 Operate and control activated sludge processes	Cert III Group F: Wastewater treatment	Required to complete this skillset	Onsite assessment	This includes measuring and reporting on system performance and process quality control. It also includes identifying faults, determining and applying technical adjustments.	This unit applies to operational staff with a specific responsibility for wastewater activated sludge in treatment plants. Those undertaking this unit would work under appropriate supervision, performing routine tasks within a familiar context.
6	NWPTRT037 Operate and control nutrient removal processes	Cert III Group F: Wastewater treatment	Required to complete this skillset	Onsite assessment	This unit includes operating and controlling nutrient removal processes, measuring and reporting on process performance. It also includes identifying faults, determining and applying technical adjustments	This unit applies to operational staff with a specific responsibility for nutrient removal. Those undertaking this unit would work under appropriate supervision, while performing routine tasks within a familiar context.

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
7	NWPTRT023 Monitor and operate ultraviolet processes	Cert III Group H: General elective units Cert II General elective unit	Required unless previously completed	Also included in water treatment skillset Onsite assessment	This unit includes preparing and maintaining UV irradiation disinfection processes and reporting on microbiological quality control.	This unit applies to operational staff with specific responsibility for ensuring UV irradiation disinfection systems comply with workplace requirements. Those undertaking this unit would work under appropriate supervision while performing routine tasks in a range of familiar contexts.
8	NWPNET065 Perform odour and infiltration investigations	Cert III Group D networks	Required to complete this skillset	Also included in networks skillset. Onsite assessment	This unit includes investigating and reporting odours and infiltration problems in the wastewater collection and transfer systems. It also includes resolving wastewater system problems, operating technical equipment and preparing technical reports.	This unit applies to those working as field and operational staff, with a specific responsibility for ensuring odour and infiltration problems are identified and remedied. Those undertaking this unit would work under appropriate supervision, while performing routine tasks in a familiar context, and ensuring minimum damage to the environment.

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
9	NWPTRT022 Monitor and operate hypochlorite disinfection processes	Cert III Group H: General elective units Cert II General elective	Only required if within job function, unless previously completed	Also included in fundamental training – water stream. Onsite assessment	This unit includes monitoring hypochlorite disinfection systems and reporting on process quality control. It also includes working safely with, transporting and storing sodium hypochlorite solution or calcium hypochlorite solids and implementing emergency response procedures.	This unit applies to operational staff with specific responsibility for hypochlorite disinfection systems in water or wastewater treatment plants. Those undertaking this unit would work under appropriate supervision, while performing routine tasks, in a range of familiar contexts.
10	NWPTRT038 Operate and control fixed film processes	Cert III Group F: Wastewater treatment	Only required if within job function	Onsite assessment	This unit includes monitoring fixed film processes such as trickling filters, Moving Bed Bioreactor and rotating biological contactors. It also includes measuring and reporting on system performance and process quality control.	This unit applies to operational staff with a specific responsibility for fixed film processes in treatment assets. Those undertaking this unit would work under appropriate supervision, while performing routine tasks, within a range of familiar contexts.

	Unit of competency	Current status in NWP training package	Required or optional	Comment/type of assessment	Unit description	Guidance and level of supervision
11	NWPTRT028 Operate and control reclaimed water irrigation	Cert III Group F: Wastewater treatment	Only required if within job function	Onsite assessment	This unit includes assessing sites for reclaimed water irrigation and quality of reclaimed water for irrigation. It also includes implementing reclaimed water irrigation, responding to water or soil quality issues and compiling reclaimed water irrigation records.	This unit applies to staff members with a specific responsibility for analysing the critical aspects of reclaimed water reuse management relating to a project or site and implementing reclaimed water reuse irrigation. Those undertaking this unit would work under appropriate supervision, performing routine tasks in a familiar context, and ensuring minimum damage to the environment.

7.8 Appendix H Advanced networks training program

Table 8 Advanced networks training program

	Unit of competency	Current status in NWP training package	Only required if within job function	Comment/type of assessment	Unit description	Guidance and level of supervision
1	NWPNET040 Maintain and repair network assets for wastewater	Cert III Group D: Networks Cert II General elective units	Required unless previously completed	Onsite assessment	This unit includes conducting maintenance and repair on a variety of wastewater distribution assets including pipes, drains and wastewater collection assets. It also includes reviewing, reporting and recording work.	This unit applies to those working as field staff with specific responsibility for ensuring repair and maintenance of wastewater assets is completed in a safe and timely manner. Those undertaking this unit would work under appropriate supervision, while performing routine tasks, in a familiar context, and ensuring minimum damage to the environment

	Unit of competency	Current status in NWP training package	Only required if within job function	Comment/type of assessment	Unit description	Guidance and level of supervision
2	NWPNET061 Maintain and repair network assets for drinking water	Cert III Group D: Networks Cert II General elective units	Required unless previously completed	Onsite assessment	This unit involves the skills and knowledge required to maintain and repair network assets for drinking water. It includes conducting maintenance and repairs on a variety of water distribution assets including storages, pumping stations, dosing stations and pipelines. It also includes reviewing, reporting and recording work.	This unit applies to those working as field staff with specific responsibility for ensuring the repair and maintenance of water assets. Those undertaking this unit would work under appropriate supervision while performing routine tasks in a familiar context and ensuring minimum damage to the environment.
3	NWPGEN023 Use maps, plans, drawings and details	Cert III Group H: General elective units Cert II General elective units	Required unless previously completed	Onsite assessment	This unit includes reading and interpreting maps, plans, drawings and specifications and recording and advising on changes and errors	This unit applies to those using maps, plans and drawings in industry. Those undertaking this unit would work under appropriate supervision, while performing routine tasks in a range of contexts.

	Unit of competency	Current status in NWP training package	Only required if within job function	Comment/type of assessment	Unit description	Guidance and level of supervision
4	NWPNET029 Locate, identify and protect utilities	Cert II General elective units	Required unless previously completed	Onsite assessment	This unit includes preparing to locate utility services at the worksite, locating utility assets by excavation, operating plant near underground or overhead utility assets. It also includes protecting and supporting utility assets during excavation and backfilling and initiating emergency procedures.	This unit applies to those involved in locating, constructing, repairing or installing underground utility infrastructure to prevent damage, injury, death or loss of service. Those undertaking this unit would work under appropriate supervision, performing routine tasks, in mostly familiar context ensuring minimum damage to the environment.

	Unit of competency	Current status in NWP training package	Only required if within job function	Comment/type of assessment	Unit description	Guidance and level of supervision
5	NWPNET065 Perform odour and infiltration investigations	Cert III Group D networks	Required unless previously completed	Also included in wastewater and/or recycled water skillset Onsite assessment	This unit includes investigating and reporting odours and infiltration problems in the wastewater collection and transfer systems. It also includes resolving wastewater system problems, operating technical equipment and preparing technical reports	This unit applies to those working as field and operational staff, with a specific responsibility for ensuring odour and infiltration problems are identified and remedied. Those undertaking this unit would work under appropriate supervision, while performing routine tasks in a familiar context, and ensuring minimum damage to the environment.

	Unit of competency	Current status in NWP training package	Only required if within job function	Comment/type of assessment	Unit description	Guidance and level of supervision
6	NWPNET047 Install, maintain and repair hydrants	Cert III Group D: Networks	Required to complete this skillset	Onsite assessment	This unit includes conducting a risk assessment, isolating and testing hydrant repairs. It also includes ensuring replacement hydrant is in working order and worksite is restored.	This unit applies to those working as field staff with specific responsibility for ensuring the work related to hydrants is completed in compliance with all relevant organisational and statutory requirements. Those undertaking this unit work independently under appropriate supervision while performing routine tasks, and ensuring minimum damage to the environment, in a familiar context.

	Unit of competency	Current status in NWP training package	Only required if within job function	Comment/type of assessment	Unit description	Guidance and level of supervision
7	NWPNET060 Clean networks using air scouring, chemical or swabbing techniques	Cert II General elective units Cert III Group H: General elective units	Required unless previously completed	Onsite assessment	This unit includes planning and preparing the worksite and conducting and completing cleaning activities.	This unit applies to those using swabs or air scouring to undergo cleaning of network pipes. Those undertaking this unit would work independently under indirect supervision while performing routine tasks with a moderate level of complexity in familiar contexts. The skills and knowledge described in this unit must be applied within the legislative, regulatory and policy environment in which they are carried out. Workplace policies and procedures must be consulted and adhered to.
8	MSMSS000019 or equivalent (skillset) Operate a drain cleaning system	Manufacturing training package	Required to complete this skillset	Onsite assessment	This skill set (4 units) reflects the skill requirements to safely and effectively operate a drain cleaning system independently.	The attainment of this skillset meets the minimum industry requirements for an independent operator undertaking drain cleaning

	Unit of competency	Current status in NWP training package	Only required if within job function	Comment/type of assessment	Unit description	Guidance and level of supervision
9	NWPNET018 Disinfect network assets	Cert III Group D: Networks	Required to complete this skillset	Onsite assessment	This unit includes planning and preparing the worksite and performing volumetric calculations, when additional disinfection is required	This unit applies to those working as field and operational staff with responsibility for the operation and maintenance of chemical dosing equipment. Those undertaking this unit would work independently, under appropriate supervision, while performing routine tasks with a moderate level of complexity in a familiar context.

	Unit of competency	Current status in NWP training package	Only required if within job function	Comment/type of assessment	Unit description	Guidance and level of supervision
10	NWPNET030 Identify and respond to water quality problems	Cert III Group D: Networks	Required to complete this skillset	Onsite assessment	This unit includes monitoring, identifying, and resolving water quality problems in water distribution systems. It also includes identifying and investigating operational problems, collecting samples, analysing technical information, communicating effectively with stakeholders and interpreting and applying incident management procedures.	This unit applies to field and operational staff with a specific responsibility for monitoring water quality and responding to issues affecting water quality in distribution systems. Those undertaking this unit would work under appropriate supervision, while performing routine tasks, in a familiar context, and ensuring minimum damage to the environment

	Unit of competency	Current status in NWP training package	Only required if within job function	Comment/type of assessment	Unit description	Guidance and level of supervision
11	CPCPWT4022 Commission and maintain backflow prevention devices	Construction, plumbing and services training package	See comment	**Current pre-requisites:** CPCPCM2043 Carry out WHS requirements CPCPWT3027 Install backflow prevention devices. Actively pursuing a solution to pre-req and licencing requirements. Onsite assessment.	This unit specifies the skills and knowledge required to test, commission and maintain backflow prevention devices in water services.	This unit applies to those working in operational roles. They generally work under supervision to undertake a prescribed range of functions involving known routines and procedures and take some responsibility for the quality of work outcomes.

	Unit of competency	Current status in NWP training package	Only required if within job function	Comment/type of assessment	Unit description	Guidance and level of supervision
12	RIICCM210E Install trench support	Cert III Group D: Networks	Required to complete this skillset	Onsite assessment	This unit describes the skills and knowledge required to install trench support in civil construction, including both installing and removing trench shoring	This unit applies to those working in operational roles. They generally work under supervision to undertake a prescribed range of functions involving known routines and procedures and take some responsibility for the quality of work outcomes.
13	MSMSS00021 (skillset) Operate a hydro excavation system	Manufacturing training package	Required to complete this skillset	Onsite assessment	This skill set (4 units) reflects the skill requirements to safely and effectively operate a hydro excavation system independently.	This skill set is for a member of the hydro excavation team who needs to be competent to operate independently. This not only involves technical competence in hydro excavation but also requires safe operation at a worksite that is not familiar to the operator.

	Unit of competency	Current status in NWP training package	Only required if within job function	Comment/type of assessment	Unit description	Guidance and level of supervision
14	NWPNET036 Perform leak detection	Cert III Group D: Networks	Required to complete this skillset	Onsite assessment	This unit includes planning leak detection activities and locating, identifying and reporting leaks in pressure mains water distribution networks.	This unit applies to those working as field staff with a specific responsibility for planning and implementing leak detection activities. Those undertaking this unit would work under appropriate supervision, while performing routine tasks in a familiar context, and ensuring minimum damage to the environment.

7.9 Appendix I Key to units of competency codes

Table 9 Key to units of competency codes

Code	Training package	Industry sector/Competency field
NWPGEN	National water package	General
NWPNET	National water package	Networks
NWPTRT	National water package	Treatment
BSBWHS	Business services training package	WHS
TLID	Transport and Logistics	Load handling
MSMWHS	Manufacturing training package	WHS
MSMSS	Manufacturing training package	Skill set
CPCPCM	Construction, plumbing and services training package	Plumbing
CPCPWT	Construction, plumbing and services training package	Plumbing and fire services

7.10 Appendix J Underpinning skills, knowledge and assessment criteria

This appendix presents an example of an expanded unit of competency document, describing additional evidence to achieve competency in a specific unit, using NWPGEN021 as an example.

NWPGEN021 - Sample and test wastewater

This document details the expectations for delivery of the National Water Training Package unit of competency NWPGEN021 - Sample and test wastewater when delivered as part of the competency benchmark for local water utility operators.

This document draws on the existing content of NWPGEN021 and provides additional performance evidence and knowledge evidence related to the underpinning skills and knowledge relevant to operations roles in the NSW local water utility sector.

The red font indicates additional performance evidence and knowledge evidence that will be required in this UOC. The red font also provides greater clarity to RTOs when delivering and assessing competence against this UOC.

RTOs should also refer to the learning specification for wastewater fundamentals training to ensure skills, knowledge and assessment requirements are not duplicated across multiple units of competency.

Additional requirements added in this specification will likely increase the volume of learning compared to the original UOC.

Application

This unit involves the skills and knowledge required to sample and test wastewater.

It includes preparing for and conducting wastewater sampling and testing and finalising work. It also includes collecting and preparing wastewater samples and performing wastewater tests. This unit does not include off-site laboratory testing.

This unit applies to those working in field operations in NSW local water utilities specific to municipal wastewater treatment plants. Those undertaking this unit would work under appropriate supervision, while performing routine tasks in a range of familiar contexts.

It is expected that RTOs delivering this unit would meet the additional performance and knowledge evidence and contextualise these requirements to meet local water utility condition and needs.

Pre-requisite nit

Not applicable.

Competency Field

General

Unit Sector

Not applicable.

Elements

Elements describe the essential outcomes.

1 Prepare for wastewater sampling and testing
2 Conduct wastewater sampling and testing
3 Finalise work

Performance critera

Performance criteria describe the performance needed to demonstrate achievement of the element.

1.1 Determine work requirements from standard operating procedures
1.2 Confirm and record samples, locations and tests to comply with requirements
1.3 Select and check and relevant equipment and tools to meet tasks and safety requirements
1.4 Select and apply relevant sample preservation methods
1.5 Select, fit and use personal protective equipment according to workplace procedures
2.1 Apply chain of custody principles according to workplace procedures
2.2 Collect samples ensuring types, locations, times and labels comply with requirements and workplace procedures
2.3 Prepare samples for off-site laboratory testing according to requirements
2.4 Maintain integrity of samples during sampling and worksite testing
2.5 Conduct worksite wastewater quality tests according to workplace procedures and record results
2.6 Assess and report abnormal characteristics to relevant personnel
3.1 Clear and restore work area according to workplace procedures
3.2 Report observations or measurements requiring further action to relevant personnel
3.3 Dispose of samples, clean and store test equipment according to workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Assessment requirements

Performance Evidence

- assessing risks
- calibrating worksite testing equipment
- collecting samples from the following:
  - raw wastewater
  - mixed liquor

  - sludges
  - effluent
  - reclaimed water
- disposing of waste and spent samples
- following sampling and testing procedures
- performing the following types of water quality tests on the collected samples:
  - ammonia
  - nitrates
  - phosphorus
  - alkalinity
  - pH
- perform the following types of worksite tests on the collected samples:
  - dissolved oxygen
  - redox potential
  - settleability:
    - mixed liquor suspended solids MLSS
    - 1000 mL cylinder settlement
    - settleability – stirred cylinder
  - mixed liquor volatile suspended solids MLVSS
  - turbidity
  - sludge blanket depth
  - residual chlorine
  - visual observations
- planning and preparing for wastewater sampling tasks
- preparing, checking and using equipment
- preparing, collecting, labelling and preserving wastewater samples
- determination/ calculation of process parameter values from rest results/ data:
  - mixed liquor suspended solids MLSS concentration
  - sludge volume index
  - zone settling velocity ZSV
  - stirred specific volume SSV
  - arithmetic/statistical values

        - average
        - median
        - decile
        - total
    - quantitative computations:
        - load assessment (eg mass from flow and concentration data)
        - solids computation (using percent solids, mass and concentration)
- recording all required information

Knowledge evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements and performance criteria and includes knowledge of:

- abnormal characteristics of wastewater samples and test results
- chain of custody
- effects of weather and conditions on work
- hazards associated with collection of wastewater samples
- maintenance and storage of reagents
- purposes of worksite wastewater testing and sampling
- range of on-site wastewater testing and sampling:
    - raw sewage
    - sludge (digesters/ sludge lagoons)
    - mixed liquor
    - effluent
    - biosolids
    - soil (effluent irrigation)
- requirements for maintaining sample integrity
- sample collection methods:
    - composite (types and comparison)
    - set time/ volume (not preferred)
    - time proportioned
    - volume proportioned (preferred)
    - grab

- sampling procedure for the following tests:
  - chemical
  - microbial
  - physical
- wastewater sample preparation – including sample container/bottle requirements
- workplace policies and procedures

Assessment conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated workplace operational situations that replicate workplace conditions.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry.
- applicable documentation including legislation, regulations, codes of practice, workplace procedures and operation manuals.